

The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

VOL. VI. No. 159

JULY 1, 1922

Prepaid Annual Subscription:
United Kingdom, \$1.1.0; Abroad, \$1.6.0.

Contents

| | PAGE |
|---|------|
| EDITORIAL NOTES: A Fresh Start; A National Chemical Policy; The Problem of Heat Insulation; Chemical Fire Extinguishers | 865 |
| The Triumphal Chariot of Chemistry. By Dr. Stephen Miall | 868 |
| London Welcomes to Dr. Ruttan | 871 |
| Intensive Systems of Sulphuric Acid Manufacture. By William Macnab, F.I.C. | 872 |
| Annual Meeting of the Society of Chemical Industry: Notes on the Glasgow Arrangements | 874 |
| Interview with Dr. Charles Parsons | 876 |
| National Physical Laboratory: Annual Inspection; Tariff Changes | 877 |
| Chemical Matters in Parliament | 878 |
| From Week to Week | 879 |
| References to Current Literature | 880 |
| Patent Literature | 881 |
| Market Report and Current Prices | 884 |
| Scottish Chemical Market | 886 |
| Safeguarding Act Awards; Contracts for Coal Tar Pitch | 887 |
| British Dyestuffs Corporation, Ltd.: Chairman's Speech at the Annual Meeting | 888 |
| Company News | 891 |
| Commercial Intelligence | 892 |

NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

The prepaid subscription to THE CHEMICAL AGE is 21s. per annum for the United Kingdom, and 26s. abroad. Cheques, Money Orders and Postal Orders should be made payable to Benn Brothers, Ltd.

Editorial and General Offices—8, Bouverie St., London, E.C.4.
Telegrams: "Allangas, Fleet, London." Telephone: City 9852 (5 lines).

A Fresh Start

THE general meeting of the British Dyestuffs Corporation held last week will, it is to be hoped, mark a new starting-point in the history of the Corporation and of the dyestuffs industry. The policy laid down in the directors' report, and further explained by Sir William Alexander in his clear and straightforward speech from the chair, has been endorsed by the shareholders by a majority of well over two to one. If the Government proxy for over a million votes had been exercised, the majority would have been over three to one. There would have been no discredit in exercising this proxy, for the Government are as much concerned in the success of the Corporation and the larger national interests which it represents as the shareholders, though in a different way. The general effect, however, is improved by allowing the shareholders to decide the matter for themselves. Their decision is conclusive. There is only one course which the minority can now loyally follow. That is to regard past controversies as disposed of and to work unitedly

for success on the co-operative plan laid down. To adopt any other attitude would be to work against the interests alike of themselves, the Corporation, and the industry. The new policy and the men in charge of it are entitled to the fullest and fairest chance of making good, and the public will have little sympathy with any attempt to add to the inherent difficulties of their task.

Sir William Alexander may be congratulated on the firm and at the same time temperate and entirely unprovocative terms in which he reviewed a very complicated situation. With an admirable economy of words, with no trace of being influenced by anything except business reasons, and with no reference to private aspects except those his position precluded him from ignoring, he described the position as he found it and the policy which has been designed to meet it. The essential feature of that policy is "co-ordination of effort," which we take to be much the same thing as the "collective and unified control" advocated by ourselves in last week's issue. The arrangement looks sound and orderly. At the head will be Sir William Alexander as chairman and managing director, and with him, of course, will be associated the other directors, apparently a quite united body. Dr. J. C. Burnham will act as general works manager. He is not, as we understand, a specialist in the chemistry and technology of dye manufacture. If he were he might be less qualified than he is reported to be for taking the general and balanced view of the works as a whole which is essential to right proportions and effective co-ordination. He has, however, had very responsible experience in works administration, having acted as general works manager at the Gretna Munitions Factory. The directors feel they can rely on the chemical and technical staff for the requisite knowledge under proper direction, and the research work will be in charge of Professor A. G. Green, F.R.S., and Mr. J. Baddiley, M.Sc. In such circumstances, the suggestion that science and technology are being ignored in the new arrangements seems unintelligible. What strikes us as a most valuable step towards securing "harmonious working towards a common end" is the establishment of weekly meetings of the heads of the technical and selling staffs. At these meetings, we are told, "all matters relating to production, distribution, and the co-ordination of research with works operations are fully discussed, and it is our policy that these meetings shall form the basis of an internal organisation, under the supervision of the managing director, which will ultimately cover all fields of the company's trading activities." That, in outline, is the plan which the shareholders have endorsed. It has obviously been carefully thought out, and seems well designed to meet the situation. Those responsible for bringing it to success are entitled to confidence and active support.

The "German negotiations" myth was, as we anticipated, easily disposed of. Conversations have taken place, but from the British side they have been conducted on the basis that any arrangement should leave inviolate the principle on which the Corporation was founded, namely, the establishment of a dye-making industry in this country adequate to our needs, both in peace and in war. The Germans, naturally, do not like this fundamental principle. The important point is that they will not be allowed to get round it. Those responsible for the Corporation's new policy have admittedly a difficult task. Sir William Alexander frankly recognises that his job will be no "picnic," and confidence in his leadership will not be diminished by his recognition of the difficulties. But his general outlook is not pessimistic. "You have no commitments," he told the shareholders, "except those necessary for current production; you have co-ordination of production and demand; you have improved quality from every point of view; expenses have been curtailed; your works are better managed and more cheaply and efficiently directed than ever before; you are steadily adding new colours of good quality to your list, and you have cash assets which exceed £1,000,000." These are not at all bad results for the present; the future, we hope, may see them substantially added to.

The meeting did well to avoid personal issues as far as possible, and we are anxious to do the same. But a friendly word on Dr. Levinstein's position may be permitted. He is, by universal assent, a man of brilliant scientific qualities, of exceptional experience in the chemistry and manufacture of dyestuffs, and of great personal charm. His life-long association with the industry must make his withdrawal a matter of deep regret to himself and to his many friends. Acting on his convictions, however, he raised a very definite issue, and the shareholders have endorsed a policy he did not favour. Much as the loss of Dr. Levinstein's services will be regretted, the choice, as we understand it, lay between individual and collective control; and the Corporation has adopted the collective policy in the belief that it is the best to meet present difficulties and to build up an organisation for the future.

A National Chemical Policy

THE article we publish this week from Dr. Stephen Miall is a suggestive contribution towards a national policy for the chemical profession and industry. "I am fully convinced," he writes, "that the Government will very quickly do what chemists want if only the chemists will shout their programme loud enough." The difficulty hitherto has been that they have no collective national policy; even if they had there is no official body for putting it formally before the Government. The first step, therefore, is to secure a starting-point for a policy, and for an organization to promote it. Dr. Miall's article suggests this in general terms, and his scheme has the advantage of leaving the details to be worked out in due course. The general principle is the co-ordination of the recognised chemical societies and the provision of a suitable home for them and the Chemical Industry Club. The sum mentioned as necessary for these purposes is from £10,000 to £20,000,

which may be gradually collected over a period of years. A small organising committee is already in existence, and donations of £50 each have been promised by Sir William Pope, Dr. E. F. Armstrong, and Dr. Miall. It is proposed that the annual meeting—especially the annual dinner—in Glasgow next week of the Society of Chemical Industry should be utilised for the preliminary discussion of this matter. It would provide an extremely interesting topic both for public discussion and for private exchanges of opinion, and the opportunity for setting some such movement going is too good to be lost. There is a general and a growing feeling that the mentality of chemistry has been too introspective; its commercial and public sides deserve fuller recognition, and this can only come with a broadening of outlook and more open contact with national life.

The general scheme outlined by Dr. Miall deserves and will, we believe, command wide and hearty support. In one detail a comparison he makes—as comparisons so often do—may imply more than the facts justify and, perhaps, more than is intended. The circumstances under which Dr. Ludwig Mond, Sir John Brunner, and the Solvays co-operated in the establishment of one of our greatest industries are vastly different from those in which the British Dyestuffs Corporation was formed. The former was a commercial enterprise planned by private persons of great foresight in quite normal conditions and under no pressure of national circumstances. The latter had to be established in a rush to meet national emergencies of the most vital character. The primary need at the moment was not dividend-earning, but the rapid provision for essential national needs. Remembering the emergency conditions in which the work had to be done and all the surrounding difficulties that hampered it, there is more to be proud of than to regret in recent British dyestuffs enterprise, and in any comparison with other ventures account must fairly be taken of the vast difference in circumstances.

The Problem of Heat Insulation

IT is only within comparatively recent times that the study of various types of fireclays and their suitability for specific purposes has received that amount of scientific attention which the magnitude of the industry should have warranted years ago. Recently the science of refractory materials has developed at an amazing speed, so much so that it is difficult for those other than specialists in the subject to keep in touch with all that is published in connexion with it.

About a year ago we drew attention in these columns to the important question of heat insulation. At that time we discussed the prevailing theories as to the effect of physical structure on heat-retaining properties, and showed that opinions as to what formed the most effective material for insulation were decidedly contradictory. At last week's meeting of the Institution of Gas Engineers an attempt was made to bring the matter nearer a solution. Mr. A. T. Green, in introducing the subject pointed out that thermal conductivity should clearly exert considerable influence in the selection of refractories, while the heating efficiency of much high temperature work cannot be computed without a knowledge of those quantitative data which

measure the fundamental thermal properties of clay products. The majority have pinned their faith to the fact that thermal conductivity is almost solely dependent upon porosity of structure; but some later workers have contended that, while porosity plays a definite part at lower temperatures, the situation is entirely changed when we come to deal with temperatures such as are employed in many industrial operations to-day. Mr. Green comes along with the useful warning that while it cannot be refuted that there is a relationship between thermal conductivity and porosity the limitations of the relationship should be frankly recognised. Dr. Mellor, it will be recalled, has suggested that radiation across pore spaces at high temperatures is likely to be comparable with the conduction through the solid material. As opposed to this, other investigators have concluded that at ordinary temperatures the insulating properties of the pore space are always maintained. Mr. Green would appear to support Dr. Mellor's theory that the pore spaces at higher temperatures have not the great insulating capacity accorded them; but he came in for a good deal of criticism from Professor Cobb, who pointed to the fact that something which it was quite easy to overlook, had been overlooked. It is when experts disagree upon a problem of this kind, which to the practical mind does not appear impossible of solution, that the situation becomes interesting. Some time back we drew attention to the desirability of threshing the matter out, for special heat-insulating materials are by no means inexpensive, and it would be as well to know whether or not by purchasing them we are wasting money.

Chemical Fire Extinguishers

THE British Engineering Standards Association has just issued its standard specification (known as B.S. Specification, No. 138, 1922, 1S.) for materials and constructional strength of liquid chemical fire extinguishers. The desirability of standardisation in connexion with chemical fire extinguishers was brought to the notice of the Association by the Association of Liquid Chemical Fire Extinguisher Manufacturers after correspondence with the various Government Departments. A conference of all interests concerned was convened by the Association, and as a result a sectional committee was formed to undertake this work. One of the ruling principles of the Association is that no standards are prepared which would in any way interfere with progress and inventive design, and whilst it was generally recognised that standard methods of operation and interchangeability of parts of chemical fire extinguishers would be of material advantage to Government Departments and other large users the trade felt that it would not at present be to the best interests of the industries concerned to carry the standardisation to this extent. The scope of the specification has, therefore, been confined mainly to materials and constructional strength.

Every extinguisher purporting to be made in accordance with this specification must, when completed, withstand an internal hydraulic pressure of 300 lb. per square inch. The pressure generated in the machine under working conditions must not exceed 100 lb. per

square inch, and at least 95 per cent. of the fluid in the vessel must be automatically discharged. General requirements are laid down for the cap joint, cage, bottles, charge nozzle, etc., which, while essential to the efficiency of the machine, impose no restrictions on the design.

Points from our News Pages

- Dr. Stephen Miall contributes an article containing suggestions for a national chemical policy supported by the recognised chemical organizations (p. 868).
- Notes are published on the London receptions given to Dr. Ruttan by the London Section of the Society of Chemical Industry and jointly by the Chemical Engineering Group and Chemical Industry Club (p. 871).
- Mr. William Macnab follows up some recent articles with some valuable notes on the "Intensive Systems of Sulphuric Acid Manufacture" (p. 872).
- Preliminary notes are published on the annual meeting of the Society of Chemical Industry at Glasgow, with photographs of prominent Glasgow men and a map of the city (p. 873).
- A full report is published of the general meeting of the British Dyestuffs Corporation, at which Sir William Alexander reviewed the position and explained the policy decided on (p. 888).
- Our London Market Report states that prices are on the up grade with a substantial turnover in one or two directions (p. 884).
- According to our Scottish Market Report, inquiries during the last week have been plentiful, with prices well maintained (p. 886).

Books Received

- ORGANIC ANALYSIS. By E. de Barry Barnett and P. C. R. Thorne. London: University of London Press. Pp. 168. 7s. 6d.
- CALCULATIONS OF ANALYTICAL CHEMISTRY. By E. H. Miller. London: Macmillan and Co., Ltd. Pp. 201. 9s.
- MODERN CHEMICAL LECTURE DIAGRAMS. By Dr. Geoffrey Martin. London: Sampson Low, Marston and Co., Ltd. Pp. 88. 3s. 6d.

The Calendar

| | | |
|--------|---|--|
| July 2 | Société de Chimie Industrielle: Second Annual Congress. | Marseilles. |
| 3 | Royal Institution of Great Britain. General Meeting. 5 p.m. | Albemarle St., W.1. |
| 4 | Institute of Physics. "The Physicist in Engineering Practice." Sir J. A. Ewing. 5.30 p.m. | Institute of Electrical Engineers, London. |
| 4 | Colour Users' Association. Annual General Meeting. 11.30 a.m. | Milton Hall, Deansgate, Manchester. |
| 4 | Society of Chemical Industry: Annual Meeting. | Glasgow. |
| 5 | Parliamentary Commercial Committee. Address by Sir William Alexander. | House of Commons. |
| 8 | British Association of Chemists. Special General Meeting. 3 p.m. | Midland Hotel, Manchester. |
| 11 | Aldwych Club Luncheon. "Europe as a Market." Sir Ernest J. P. Benn. 1 p.m. | 18, Exeter Street, W.C.2. |
| 19 | Rotary Club Luncheon. "The Trade Conquest of Europe." Sir Ernest J. P. Benn. 1 p.m. | Hotel Cecil, London. |

The Triumphal Chariot of Chemistry

By Dr. Stephen Miall

The writer points out, in his characteristic style, the lack of united organisation among chemists and the many ways in which this prejudicially affects the public influence of chemistry, and he offers suggestions towards the formulation of a national policy representative of all chemical interests.

A HUNDRED years ago Pasteur was born. A professor of pure chemistry, with no medical or industrial experience, he began by investigating the crystalline forms of tartaric acid, and from this starting point he gradually developed the whole science of bacteriology, saved the lives of thousands of people by making possible antiseptic surgery, found a cure for hydrophobia and other diseases, saved the European silk cultivation, and brought wealth to the brewers and wine growers, whose disasters compelled them to apply scientific methods to the fermentation industry. In a few months the scientific men in Europe will assemble to celebrate his achievements.

Fifty years ago Ernest Solvay developed a new process for the manufacture of soda. In this country he secured the co-operation of Dr. Ludwig Mond and Sir John Brunner. Hand in hand, the chemists and business men worked out the problems involved in his process. New works were started here, in America, France, Spain and other countries, and a world-wide organisation has now been built up, giving employment to multitudes of workers and dividends to thousands of shareholders. Solvay, who died a few weeks ago, made princely donations to physical and chemical science, and, notwithstanding this, has left a huge fortune which rumour places at some millions sterling.

A week ago it was announced that the British Dyestuffs Corporation made a net loss of over a million pounds in the year 1921.

According to Taylor's Theorem, 81 different morals may be drawn from the above three statements. I propose to indicate only three of the most obvious ones. A few moments' reflection will enable the readers (if any) of this article to enunciate the remaining 78. First, the pursuit of pure scientific knowledge undertaken solely from a love of truth may be of incalculable value to the well-being of the industries of a country; second, the real co-operation of science and business is to the great advantage of both; third, the British Government, if it wishes to make an investment in a chemical business, should buy shares on the market after consultation with men who (like Sir William Pope and Dr. Moody) know enough both of chemistry and of finance to avoid some of the most glaring disasters, and the Government should stick to governing the country, and not attempt to run complicated chemical processes on a large scale.

I do not wish to imply that the Government should do nothing for chemistry; there is much it can do, and the present Government has in some respects been more sympathetic towards science and industry than any other. It is not lack of interest of which we should complain: it is only ignorance, a very curable disease, and this ignorance is shared by the public as a whole. Governments, in a democratic country, may be expected to be typical of the people they govern, and we have no right to expect an enlightened Government if the average politician, who sees through all things with his half-shut eyes, is not himself enlightened. We get the government we deserve, only often a good deal worse. I am fully convinced that the Government will very gladly do what chemists want, if only the chemists will shout their programme loud enough. This article is intended to indicate a course of elocution.

Chemistry is going to be of increasing importance. A

flourishing chemical industry and a learned and zealous body of chemists competent to undertake research will be a necessity to every nation which aspires to have prosperity. Agriculture, metallurgy, mining, and the industries which are concerned with fuel, textiles, dyes and explosives, are becoming more and more dependent on chemistry for their success.

How can we, who feel this pride in our science and watch its growing importance, ensure its appreciation by the uninitiated? We have some very powerful organisations already in existence: the Chemical Society, with 3,000 Fellows, representing pure science; the Society of Chemical Industry, with 6,000 members, representing applied chemistry; the Institute of Chemistry, with nearly 4,000 members, acting in the main as a qualifying and registering body; the Association of British Chemical Manufacturers, who look after the interest of the trade; the Federal Council, co-ordinating the activities of those societies already mentioned and several others in addition; and the Chemical Industry Club, which is performing an essential service in promoting the social instincts of the chemist. We are rather like cheese-mites, each going our own way; if Messrs. Craig, Cullen and Coley—the high C.'s of the Club—will continue their efforts, we may in time agree on a common course of action, and march off with the world in which we live. And we must not be so insular as to forget the Union Internationale de la Chimie Pure et Appliquée founded by the French chemists with the co-operation of the Federal Council. This Union will meet next year in Cambridge under the presidency of Sir William Pope, and if we are wise we shall make use of this important conference, not only to show hospitality to our foreign colleagues, but to serve our own purposes for the ultimate good of our country.

The Present State of Chemistry

The present state of chemistry in this country manifests a number of defects. We are conscious of our own merits, and of each other's infirmities, and if we enumerate the defects alone in this article, let no one suppose we have not some splendid achievements to trumpet abroad. Our chemists are second to none; our men of business are as good as any others. The Germans beat us by yoking the two to the same plough. We have, in addition to a few well developed works, a multitude of small companies, each good of its kind, but not of the importance to train up its chemists and works managers in the large view of business. And those who sell the products are too often unable to appreciate the scientific needs and difficulties of the customer. There is a lack of sympathy between our scientific and our commercial men. Only in few cases do they work together as Brunner and Mond did; in too many cases the British Dyes plan is adopted of appointing as directors first-class business men who are quite at sea in the works they run, and who find out too late that the chemists they employ, good as they are, cannot stave off disaster. We have too few business men who understand the language and ambitions of chemists, can sympathise with their difficulties, and work with them. We have too few chemists who have the experience which enables them to be of use on a Board of Directors. In this respect we do not compare favourably with the Germans. These men have to be found and trained up; it is almost true to say

[Continued on page 890]



Dr. Stephen Miall

that with the exception of the Brunner-Mond Companies, such men are not being selected and trained in chemical works in this country. The small concerns must be amalgamated and the manufactures concentrated in large factories if they are to maintain their existence. Another defect which is noticeable is the small number of men now available for serving on the various committees which are concerned in the organisation and publicity of the science. Few men interest themselves in this work, and each plays many parts—this year Treasurer of "A" Society, next year President of "B" Society, and in the following year Secretary of a third. The work has got to be done, and it would be more easily and better done if more people would take a hand in it. Some of the prominent professors and some of the wealthy manufacturers who now take little part in this work could be very useful if they would spare the necessary time. As to our relations with the Government, the trouble is that there is no chemical body whose advice the Government will take on chemical matters. Lord Moulton was very useful in this respect; he had a knowledge of chemistry and a good knowledge of chemists, and the Government would usually take his advice. That there is no simple method of getting the Government to act upon sound chemical advice is partly the fault of the Government and partly the fault of the chemists. It is not sufficient to have a few voices crying in the wilderness; a well chosen band of responsible-looking people, representing important industrial or academic interests, is required. They should be sworn to agree upon the same tale, and to tell it simply. The important men in pure and applied chemistry must lend a hand in this also.

The desired improvements will be in our own hands if we make up our minds to have them, and no new Royal Commissions, Conjoint or other Boards, Guilds, Associations or Committees will be of any use. We have already too many of these. The meeting of the Union Internationale at Cambridge next June will provide the occasion for the beginning of a determined effort. The Federal Council can do something to help the movement along; the Society of Chemical Industry can do a good deal.

An Opportunity at Glasgow

I think the Society should make use of its Annual Meetings and its Annual Dinner deliberately for public propaganda on such lines as I have indicated. On such occasions it should bear these problems in mind and consider these questions of strategy and policy rather than matters which affect only a small section of our members. Whether discussion in a lecture hall or drinking wine at a small table is the better course to procure co-operation, I do not know; both might be tried! The local section where the Annual Meeting is held should be invited to pay special attention to this point. It is not only co-operation between the chemist and the business man that we have to encourage, we have to promote co-operation between the chemists and the Government. The two policies are very closely interwoven; indeed, they are perhaps only the same policy looked at from different aspects. If the chemist is exalted, and deservedly exalted, in the estimation of the man of business, his influence with the Government will increase in a corresponding ratio.

Now all this uplifting of the chemist, valuable as it is, will cost money. Many men are deterred from attending the conferences abroad because of the expense; funds must in some way be procured to entertain the foreign guests next year; the University of Cambridge will be very generous, but we must appeal for donations in addition.

We have turned all these ideas round in the gruel which we call our brains. We intend not only to put them into practice, but also to go on with our schemes for co-ordinating the activities of all our chemical societies, and providing them and the Chemical Industry Club with a suitable home.

But we must not expect the Chemical Society or the Society of Chemical Industry to shoulder this burden. It is ourselves who have to make our own destiny, and when we have done this we can make a god of it, and spell it with a capital D.

If we had a sum of £10,000 or £20,000, we could in special years such as 1923 provide out of income the funds for entertaining the Union Internationale; in other years we could usefully spend £200 a year in uplifting chemistry, and could save up the balance as a nest-egg towards that incubator which Messrs. Pope, Armstrong, Evans and Coley picture in their minds. Once a start is made, the scheme will advance; certainly in twenty years, probably in ten years, perhaps even sooner, we can achieve some valuable result.

At the present time the country is so poor that the Government cannot be asked to assist us with a grant, and the industry cannot afford the large sums we shall ultimately require. But there seems to be no reason why small sums should not be collected now, and we may be bold enough in a few years to ask for more.

A small organising committee is being formed, and the following subscriptions are already announced:—Sir William Pope, £50; Dr. Stephen Miall, £50; Dr. E. F. Armstrong, £50.

National Union of Scientific Workers

To the Editor of THE CHEMICAL AGE.

SIR,—At the half-yearly Council meeting of the National Union of Scientific Workers, attention was drawn by the representative of the Manchester Branch to the attack made upon the position of the medical profession, owing to their hitherto privileged position with regard to submission of evidence in Courts of Justice. It was pointed out that the privileged position held by the medical profession in this respect was not granted capriciously, but had all the force of established practice and wise custom behind it. It was felt that before any reforms were instituted the whole matter should be most carefully gone into with due regard to the opinion of the medical profession, who are unquestionably in the best position to judge the serious social consequences of any such reform.

The following resolution was then adopted unanimously:—"That in the opinion of this Council of the National Union of Scientific Workers the sanctity of confidential communications to doctors by their patients is not primarily a matter for lawyers to decide, and that this Council instructs the executive to give its strenuous support to the doctor's efforts to retain intact their professional honour."—Yours, etc.,

A. G. CHURCH,
General Secretary.

25, Victoria Street, S.W.1.
June 26.

Annual Meeting Special Issues

THE next two issues of THE CHEMICAL AGE (July 8 and 15) will contain, in addition to reports of the Annual Meeting of the Society of Chemical Industry in Glasgow, an interview with the new president, and specially drawn portraits of Dr. R. F. Ruttan, Dr. E. F. Armstrong, Professor H. E. Armstrong, Professor J. W. Hinchley, Mr. J. A. Reavell, Mr. H. Talbot, and others. To insure copies of these special issues early orders should be placed with the publishers at 8, Bouverie Street, E.C., or with local agents.

The Chemical Age Index

THE Index to Volume VI. of THE CHEMICAL AGE, covering the period January 1, 1922, to July 1, 1922, will be published in THE CHEMICAL AGE next week. As the Index will be incorporated in the issue there will be no need for subscribers to make special application for it.

London Welcomes to Dr. Ruttan

It has not taken Dr. R. F. Ruttan, the President of the Society of Chemical Industry, long to win the affection of his new friends in England as completely as he had long since won that of his Canadian colleagues. He only arrived in London last week, and already he is acclaimed everywhere as a jolly good fellow. A distinguished authority on research in Canada, an excellent organiser, and a personage who counts with the Dominion Government, he manages to conceal the severer aspects of his character under a wealth of good humour and good feeling, the influence of which it would be impossible to resist. The one and only matter for regret is that he has not been able to make the acquaintance of a large number of Sections prior to the Annual Meeting. That, however, will be largely repaired at Glasgow next week, and as he hopes to prolong his stay a little after the meetings probably he will yet have sufficient time to complete his conquest.

Already privately welcomed at the Chemical Industry Club, where he has made many new acquaintances, his first official reception in this country took place on Monday evening, when he was entertained to dinner by the members of the London Section. It was not too formal an affair, and on that account the more pleasant to hosts and guest. Mr. E. V. Evans, chairman of the Section, presided, and the better known figures present included Professor H. E. Armstrong, Sir Robert Robertson, Colonel Sir Frederic Nathan, Mr. A. Chaston Chapman, Mr. W. J. U. Woolcock, M.P., Colonel Lang, Mr. Monier-Williams, and others. The chairman, who diffused a breath of the cultivated Bohemianism of the Savage Club, gave Dr. Ruttan a warm welcome, describing him as "a chemist administrator," and testifying to the value of his work in the interests of Canadian chemists and of the Society in the Dominion. Dr. Ruttan, who replied in equally unconventional terms, stated how much he appreciated the kindly welcome he had received from everyone in this country. The visit of the Society to Canada last year was, he frankly admitted, a little disappointing in numbers, but that was more than made up for by the excellent character of the delegation. The Society, he pointed out, was not merely imperial; it was international, like chemistry itself. It had its problems to face in Canada as in other places, and one gathered from his allusions to the internal chemical politics of the Dominion that the tendency there, as here, is towards a uniting of forces.

These speeches, unconventional as they were, were the nearest approach to formality achieved during the evening. The remaining speakers—Mr. Woolcock, Colonel Lang, Dr. Hendrick, and Professor H. E. Armstrong—wandered off into the pastures that most attracted them, told stories of variable quality, unburdened themselves of their favourite experiences and convictions, and contributed generally to the good fellowship of the occasion.

Pleasant as Monday's function was, a far more jovial, hearty, and democratic reception awaited Dr. Ruttan on Wednesday evening, when the Chemical Engineering Group and the Chemical Industry Club—the youthful twin forces of the chemical world—combined to welcome him at the Hotel Cecil. The committees of the two institutions first dined together, and when an expectant audience began to

stream in they heard behind the veil which screened off a portion of the Prince's Room the tinkle of glasses and the pleasant voice of Mr. Woolcock proposing the toast of the King and then extending the most cordial greeting to the President. Dr. Ruttan briefly responded, and then the open meeting began.

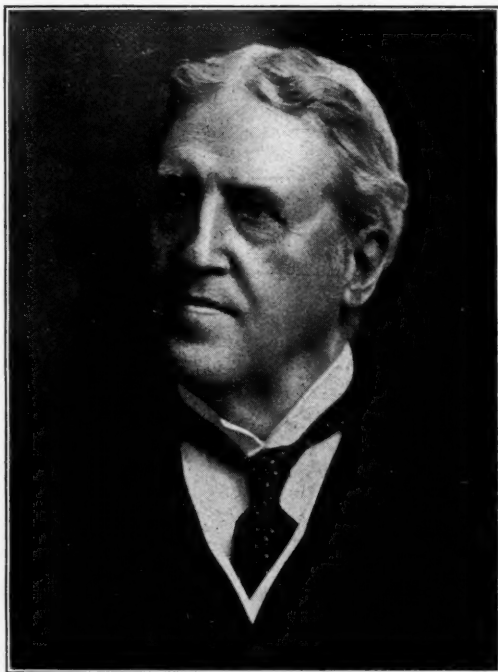
By this time a large audience had collected, and when Dr. Ruttan, accompanied by his successor in the presidency (Dr. Armstrong) appeared the members gave them a welcome not unworthy of undergraduate traditions. Mr. Reavell, most vivacious and tactful of chairmen, with just the right "touch," told Dr. Ruttan of the pleasure it gave the two bodies

both to entertain him and to hear his views on the training of the chemical engineer. In his address, Dr. Ruttan gave us the first real taste of his qualities as a thinker and organiser. In Canada, as he reminded us, the wealth of the natural resources and the need of utilising them in industry had made the demand for the chemical engineer acute, and he supplied some valuable information as to the efforts which are being made to supply it. In England, he suggested, we had not made so full a use of the rank-and-file general practitioner as Germany had done. Here a chemist studied chemistry and an engineer studied engineering, and the more intensive the study the more widely they separated. He evidently favoured the view, on which the Group is founded, that the qualities of both might with the right training be combined in one. The newest part of the address was that in which he described from personal knowledge the work of the National Institution of Technology, which gave practical instruction to students in chemical engineering and had a series of stations attached to particular industries. An encouraging feature was the hearty support of

manufacturers, and the operation of the whole scheme was being watched with great interest.

Dr. E. F. Armstrong, frankly confessing himself a "heretic," and interleaving shrewd advice with dry pleasantries, adhered to the view that what is most wanted in British chemical industry is a man who really knows some chemistry, whose knowledge is absolutely up to date, and who knows how to use a library so as to get at the latest research. The engineer, he was disposed to think, was born rather than made; if a man were a real chemist he could soon be taught what was necessary about works. There was a tendency in some quarters to teach almost everything under the sun, but to leave out chemistry. "For God's sake," said Dr. Armstrong, "teach your student chemistry, whatever else you leave out; then, speaking with some knowledge of works management, I think we shall be able to make some use of him."

Professor Donnan, appealed to for his views on the teaching of chemical students, emphasised his belief that what the young chemist principally lacked was knowledge of physics. He appeared rather to distrust the scheme of training outlined by Dr. Ruttan, and preferred the remedy of "more physics." Incidentally he paid a very warm tribute to Mr. W. Macnab (who was present) for the admirable way in which the series of official volumes, *Technical Records of Explosives Supply*, had been edited; these, he thought, convincingly testified to the importance of a sound knowledge of physics.



DR. R. F. RUTTAN

Sir Robert Robertson added some useful hints, in the course of which he suggested three stages of training:—(1) a thorough grounding in the fundamentals of chemistry; (2) physical chemistry, including a good knowledge of physics; and (3) practical acquaintance with works.

Gradually the discussion brought us round to the orthodox educational view that the basis of our effective scheme of training must be a thorough grounding in the principles of the necessary sciences, and that too early specialisation in works practice at the expense of this essential foundation, must bring

disappointing results. When Dr. Ruttan closed the discussion by insisting on the study of physical chemistry as the essential basis, one felt that the apparent differences had all resolved themselves into one agreed proposition—that the first and indispensable condition of success is a thorough training in fundamental principles.

The discussion, which never flagged for a moment, was followed by music, etc., and the President probably felt, when he reached his club, that he had had his first real "night out" since his arrival.

Intensive Systems of Sulphuric Acid Manufacture

By Wm. Macnab, F.I.C.

In response to your request for information about new processes for making sulphuric acid, the following particulars may be of interest to your readers.

Mr. K. B. Quinan, whose immense help to us during the war will never be forgotten, invented a process for making sulphuric acid without the use of the large leaden chambers, and since his return to South Africa it has been developed and worked successfully by his staff.

The plant required is substantially the same as used in the ordinary chamber process, except that the large leaden chambers are replaced by a small "bubbler" converter.

The usual gases from the burning of sulphur or pyrites are drawn, as hot as possible, through a Glover tower, where they are cooled to about 80° C., and at the same time the 66 per cent. acid which is fed to the tower is concentrated to 78-80 per cent. strength.

From the Glover tower the cooled gases and water-vapour pass to a bubbler-converter, where they are brought into intimate contact with 66 per cent. sulphuric acid charged with nitroso-sulphuric acid, and the sulphur dioxide is completely converted into sulphuric acid.

The converter consists of a vertical cylinder fitted with a number of diaphragms or plates perforated with a large number of small holes; overflow pipes projecting the desired height above each diaphragm permit the flow of the acid from plate to plate down the converter.

The gases enter underneath the lowest diaphragm and pass through the small perforations with such velocity that a depth of, say, 1 in. of acid on the plate is kept in violent agitation and prevented from passing down through the perforations. All the gas is thus brought into intimate contact with the descending sulphuric acid on all the diaphragms with the result that the gas issuing from the top of the converter is free from sulphur dioxide, but charged with oxides of nitrogen. On the other hand, the sulphuric acid charged with nitroso-sulphuric acid fed in at the top escapes at the bottom free from oxides of nitrogen, but increased by the amount of sulphuric acid formed from the sulphur dioxide in the gas.

The heat produced by the formation of sulphuric acid is controlled by the large amount of acid which is passed through the converter, and as the limits of temperature between which complete conversion takes place are wide, the process is easily regulated.

In order to recover the valuable oxides of nitrogen carried away from the converter, the gases are passed through two Gay-Lussac towers in series. The first is fed with a large quantity of 66 per cent. acid, which can absorb only a comparatively small percentage of nitrogen oxides; while the second tower is fed with a much smaller quantity of 80 per cent. acid which has been concentrated in the Glover tower, and can absorb much more nitric acid.

The acids from the two Gay-Lussacs are united and used as feed for the converter, any loss of nitric acid being replaced by fresh nitric acid introduced at any suitable point. There is thus a comparatively large quantity of acid which has to be circulated through the system, the amount of "make" being withdrawn from time to time and allowed to flow away continuously.

The acid flowing from the converter has been raised 10-15° C. in temperature by the heat evolved from the reaction in the converter, and it must be cooled sufficiently to permit it to absorb the oxides of nitrogen when it is fed to the Gay-Lussacs.

The size of a converter for an output of 2 tons per hour of sulphuric acid of 66 per cent. strength is about 9 ft. diameter by 10 ft. high.

The trials in South Africa have clearly shown that the oxidation of sulphur dioxide to sulphuric acid is complete in the converter, that the oxides of nitrogen issuing from the converter can be recovered in the Gay-Lussacs within the limits of ordinary chamber practice. The control of the process is easy, and the plant can be quickly started and stopped with a minimum of trouble.

The special requirements of this process in comparison with the chamber process are a more powerful blower to overcome the resistance to the passage of the gases through the converter; more acid to be circulated through the system, and the cooling of this acid as it emerges from the converter; also the provision of sufficient acid-storage tanks to compensate for the storage afforded in the chambers themselves.

On the other hand, there is a very large saving in the capital cost of, and space occupied by, the plant.

Chemical Trade Inquiries

| LOCALITY OR FIRM OR AGENT. | MATERIAL. | REF. No. |
|----------------------------------|--|------------------------|
| India | Chemicals and dyes | 8851/ E.D./ G.C. |
| Czecho-Slovakia | Chemicals for the glass, paper and textile industries | 721 |
| New York .. | Citric Acid, drugs, etc. | 738 |
| New York .. | Druggists' sundries | 744 |

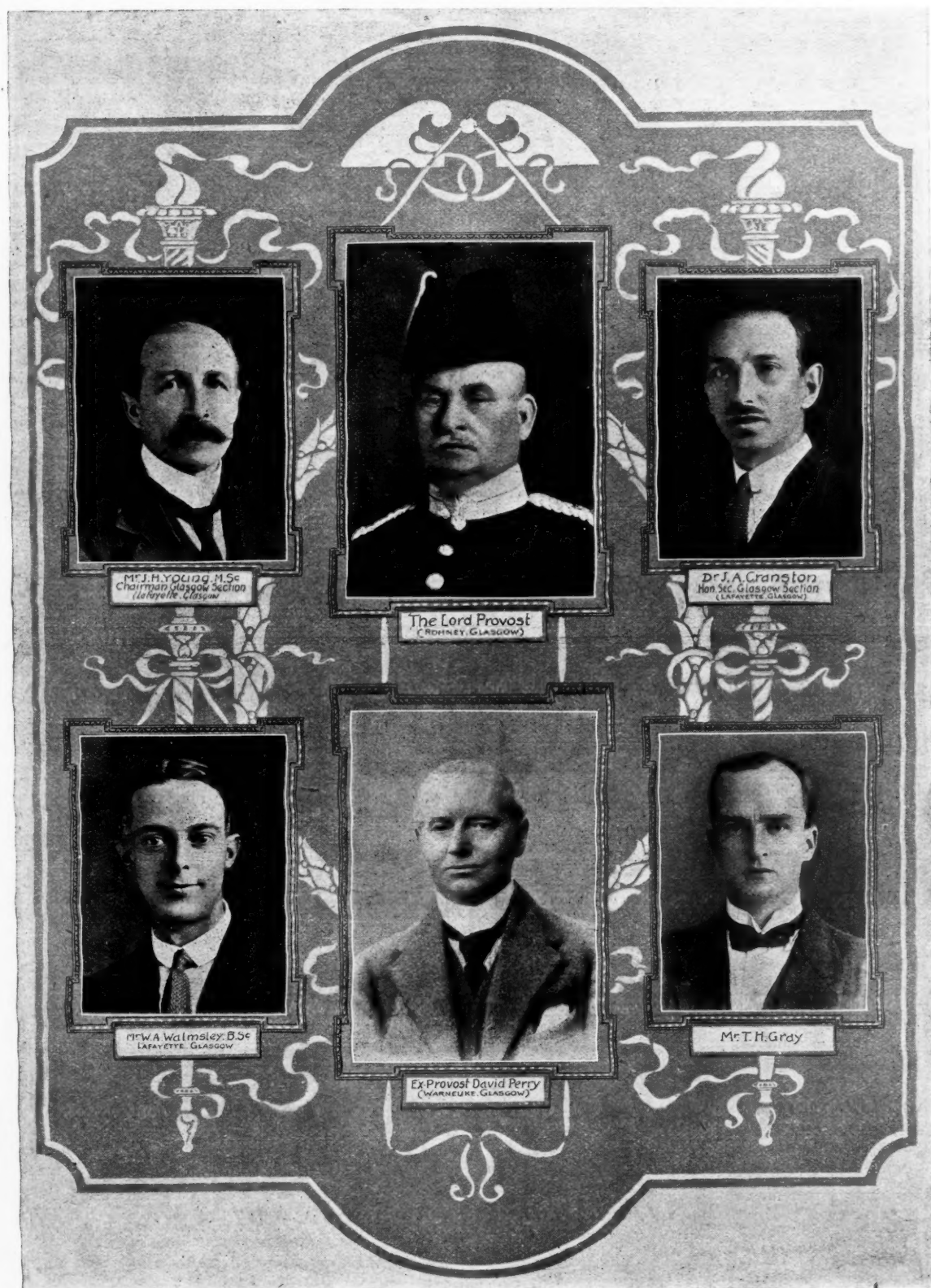
T.N.T. and Picric Acid Contracts

On Monday, in the King's Bench Division, Mr. Justice Bailhache had before him a petition of right by Mickson and Partners, Ltd., of Well Street, Bradford; Sharp and Mallett, Ltd., of Copley, Halifax; Brotherton and Co., City Chambers, Leeds; and the Graesser Monsanto Chemical Works, Ltd., of Ruabon, Denbighshire, against the Crown. Sir John Simon, K.C., and Mr. Disturnel, K.C., appeared for the suppliants, and the Attorney-General, Sir E. Pollock, K.C., for the Crown.

Sir John Simon said his clients' claim was for the balance of their account for supplying in one case T.N.T. and in the others picric acid to the Government. When they asked for the balance of the contract price, they were met with the answer that the Crown was entitled to keep the rest of the money, regarding it as a contribution from three different manufacturers under the Munitions (Liability for Explosions) Act, 1916, towards a fund which was to be available in the event of explosions causing damage to life or property of third parties. The total amount which the suppliants alleged to be still due to them was £60,000. Counsel's contention was that the deductions were not authorised by the statute and that the Crown had levied a contribution upon these manufacturers which was out of proportion.

At this point a consultation took place, with the result that it was announced that the parties had arrived at a settlement. The terms were not disclosed, the record was withdrawn, and the Crown agreed to pay the taxed costs of the suppliants.

Notable Figures at the Glasgow Meeting



Annual Meeting of the Society of Chemical Industry

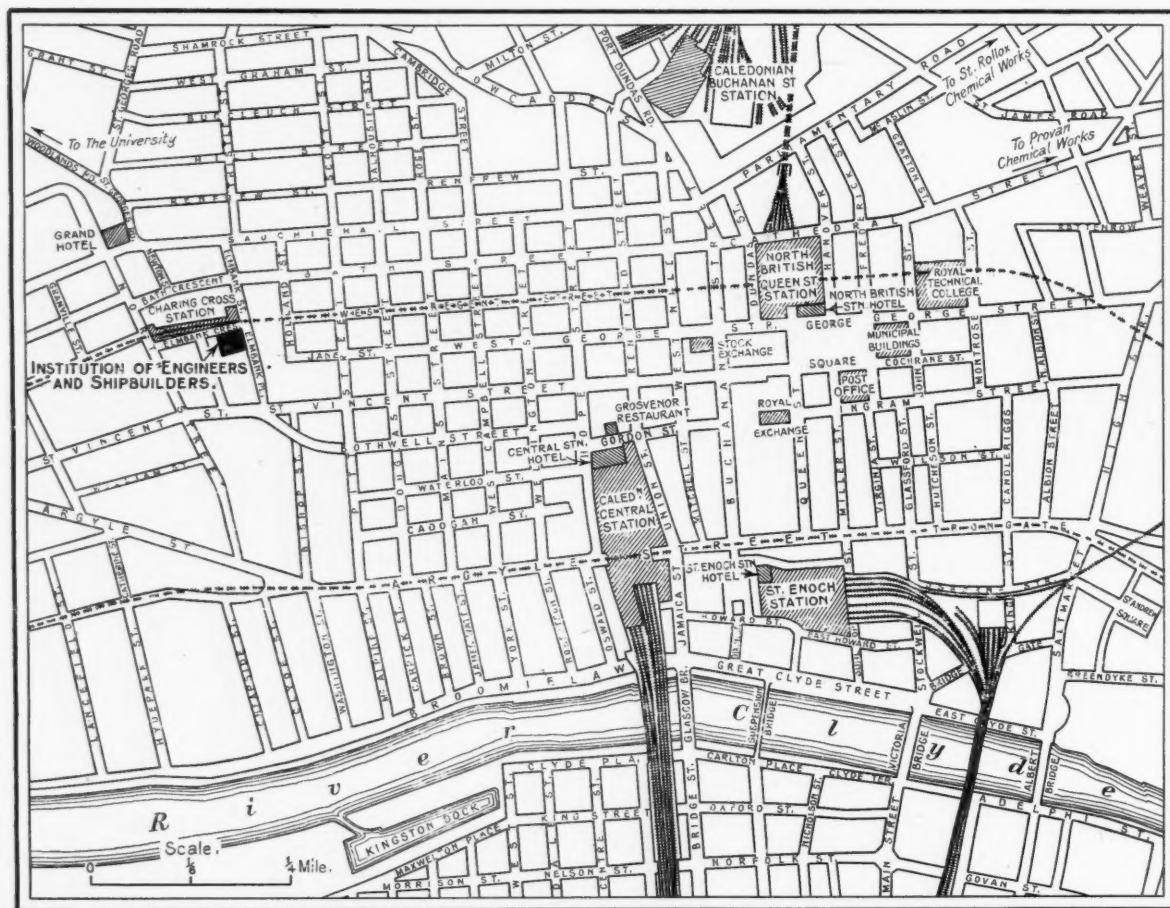
Notes on the Glasgow Arrangements

The annual meeting of the Society of Chemical Industry begins on Tuesday next, July 4, at Glasgow, and concludes on Tuesday, July 11. We give below some notes on the arrangements for the meeting.

In fixing Glasgow as the venue for their annual meeting this year, the Society of Chemical Industry have chosen one of the most interesting localities from the chemist's point of view in the United Kingdom. Glasgow and its suburbs contain many large and flourishing chemical and allied works, which delegates will have ample opportunities of inspecting during their stay in Glasgow. As will be seen from the programme of the meeting, given on page 875, visits to several of these works are provided for in the itinerary, which includes what promises to be a very interesting day at the Ardeer Works of Nobel's Explosives Co., Ltd.

Members who are familiar with Glasgow will miss a conspicuous landmark owing to the collapse in March last of the

mere satellites to the monster of the place—the chimney! "An account of the progress of these great works from their foundation in 1798 by Charles Tennant to their purchase in 1890 by the newly-formed United Alkali Co., Ltd., would fill a large volume and would also reveal remarkable developments on the manufacturing side. It is recorded that, following a paper read by Berthollet in 1785, Charles Tennant began experiments which led him to the discovery that lime, having a great affinity for chlorine gas, could imprison it, enabling its bleaching qualities to be applied in a safe and economical manner. His first important success was the manufacture of a solution of chloride of lime, or chlorine liquor, in 1788. The production of bleaching powder at



Plan of Central Glasgow

chimney at the St. Rollox Chemical Works, known as "Tennant's Stalk," which, at the time of its erection 80 years ago was reputed to be the highest chimney in the world. Originally 453 ft. high, this remarkable structure was only rivalled in height (after it had been shortened) by a chimney at the chemical works of Joseph Townsend, Ltd., Port Dundas. Although the following extract from *The Land We Live In* of 1856 describes the St. Rollox Works as they then were, great changes have since been made: "They [the works] are, necessarily, black and dirty; and some of them are as infernal in appearance as we can well imagine any earthly place to be. The buildings occupy an immense square, from which shoot up numerous chimneys. Many of these chimneys are equal to the largest in other towns; but they are here

St. Rollox in 1799 was 52 tons, and was sold at an average price of £140 per ton.

Chemical Industries of Glasgow

The representative nature of the chemical industry of Glasgow can be judged from the following brief list, showing some of its products: Acetic acid, alkali, alum, ammonia, aniline dyes, bicarbonate of soda, bichromate of potash, bisulphate of lime, bisulphite of soda, bleaching powder, borax, carbonate of ammonia, caustic soda, chemical glass, chemical stoneware, chloride of lime, copper precipitate, creosote, crucibles, disinfectants, Epsom salts, essential oils, ester gums, explosives, soap, farina, Glauber salt, fluoric acid, glue, glycerine, iodine, iron liquor, methylated spirit, muriate

of ammonia, muriatic acid, naphtha, nitrate of potash, nitrate of soda, nitric acid, oxalic acid, phosphate of soda, salt cake, silicate of soda, soda crystals, sulphate of ammonia, sulphuric acid, tar, tin crystals, vinegar, &c.

For the convenience of members who are visiting Glasgow for the first time we publish on page 874 a street plan upon which are marked the positions of the hotels, buildings, &c. which figure in the official programme.

Institution of Engineers and Shipbuilders

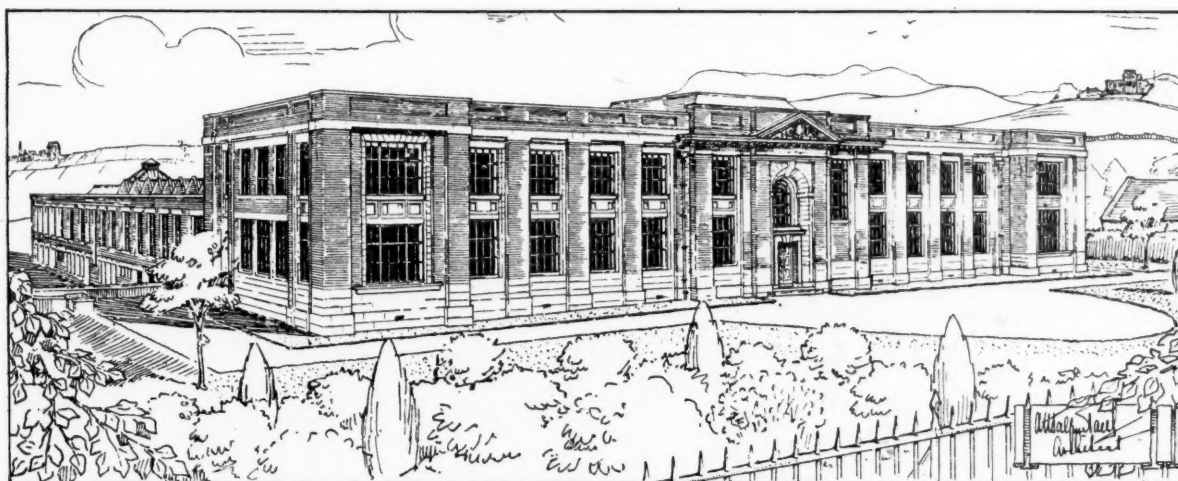
The Institution of Engineers and Shipbuilders, where the Presidential Address and the papers are to be read, forms a striking architectural feature of the district, being situated at the corner of Elmbank Street and Elmbank Crescent. Built in the style of the later English Renaissance, the entrance front faces Elmbank Crescent. Entrance is through a wide vestibule with walls panelled in white-veined and green marble between stone pilasters; this leads to the main entrance hall, having on one side the main staircase and on the other the entrance to the library and reading room. The secretary's offices, committee room, and cloak room occupy the remainder of this floor; a passenger lift is also provided here. On the first floor are the smoking room, the coffee room, a lecture hall

places of historical interest. The visit to the University will be of particular interest, in that the new chemical laboratories, the first of the King's Buildings, will be seen for the first time by many. The new laboratories are at present unfinished, but the drawing on this page gives an idea of how they will appear when completed.

The Glasgow Section

It may be of interest to note that the Glasgow Section (originally the Scottish Section) of the Society of Chemical Industry was established in January, 1884, and was the only Scottish Section until the formation of the Edinburgh Section in 1915. Its records show a considerable number of eminent chairmen, among whom may be mentioned Sir G. T. Beilby, F.R.S.; Sir Robert Pullar; Mr. David Perry and Dr. Thomas Gray. Sir J. J. Dobbie is a distinguished past hon. secretary.

The present officers of the Section are:—CHAIRMAN: Mr. J. H. Young. VICE-CHAIRMAN: Mr. W. E. Moodie. COMMITTEE: Professor R. M. Caven, Mr. L. Hislop, Mr. S. H. B. Langlands, Mr. D. N. McArthur, Mr. James McGregor, Mr. James McLeod, Mr. James McWhirter, Mr. Q. Moore, Mr. J. G. Roberts, Dr. J. G. Robertson, Mr. James Sorley, Mr.



Sketch of the New Chemical Laboratory, University of Edinburgh, as it will appear when completed

to seat 150 persons, and two large meeting and committee rooms. On the second floor there is a spacious landing, which is lighted by a richly ornamented dome, and gives access to the Council room and the main hall. The main hall extends the whole length of the Elmbank Street frontage, and is capable of seating about 420 persons. Among the most noteworthy features of the building are the rich stained glass windows which are to be seen in the main hall and on the staircase.

The Municipal Buildings, where the Lord Provost and magistrates of Glasgow are giving a reception and dance on the evening of July 4, are noted for the sumptuousness of their interior decoration, the Banqueting Hall being reputed to be one of the most magnificent in the world. Specially noteworthy are the mural decorations of that hall; these include series of panels and frescoes executed by eminent artists.

Glasgow University

While a visit to the University does not appear in the official programme, visitors will probably find an opportunity to inspect the splendidly equipped chemical laboratories there. The Royal Technical College will be visited on the evening of Friday, July 7, when a conversazione will be held.

The Excursions

Excursions to local beauty spots will take up several days, the itinerary including a sail to Dalmuir, a steamer trip on Loch Lomond, and a visit to the Trossachs. The concluding day will be spent in a visit to Edinburgh to view the numerous

R. F. Stewart, Mr. R. S. Thomson, Mr. W. Walmsley, Professor F. J. Wilson, and Mr. W. Wilson. CHAMBER OF COMMERCE REPRESENTATIVE: Mr. D. MacCallum. HONORARY SECRETARY: Dr. John A. Cranston.

Programme of Arrangements

Tuesday, July 4

- 10.45 a.m. Annual General Meeting. Delivery of President's Address in the Institution of Engineers and Shipbuilders.
- 1 p.m. Luncheon, by invitation of the Glasgow Section, in the Grosvenor Restaurant, Gordon Street.
- 3 p.m. Garden Party at "The Knowe," Pollokshields, by kind invitation of David Perry, Esq.
- 7.30 p.m. Reception and Dance in the Municipal Buildings, by the invitation of the Rt. Hon. the Lord Provost and Magistrates of Glasgow.

Wednesday, July 5

- 10 a.m. Messel Memorial Lecture. To be delivered by Professor H. E. Armstrong, F.R.S.
- PAPERS: "A Rapid and Accurate Method for the Calibration of Storage Tanks," by Dr. J. W. McDavid; "The Viscosity of Cellulose in Cuprammonium Hydroxide," by Dr. R. A. Joyner.
- 1 p.m. Informal Luncheon in the Grosvenor Restaurant.
- 2.30 p.m. Either of the following may be visited: Provan Chemical Works; Dalmarnock Power Station.
- 7.30 p.m. The Annual Dinner will be held in the Grosvenor Restaurant, the President in the chair.

Thursday, July 6

- 10 a.m. Cinematograph Exhibition, the Picture House, Sauchiehall Street, or visit to harbour and a sail from Glasgow to Dalmuir and return.
- 1 p.m. Informal luncheon in the Grosvenor Restaurant.
- 2.30 p.m. Chemical Engineering Group's Fifth Conference. Subject: "Evaporation and Distillation." First session. "Observations on the Design of Ammoniacal Liquor Stills," by P. Parrish, A.I.C., "Tar Distillation," by W. A. Walmsley.
- 7.30 p.m. Chemical Engineering Group. Second Session. "The General Problem of Evaporation," by Professor J. W. Hinckley; "Glycerine Distillation," by T. H. Gray.

Friday, July 7

- 10 a.m. Excursion on Loch Lomond. Train will leave Glasgow about 10 a.m. The steamer will leave Balloch about 11 a.m., and will sail to the head of the Loch and return. Members will reach Glasgow about 6 p.m. Luncheon and tea will be provided on board. The steamer will remain at Tarbet for 1½ hours to give members the opportunity of visiting Loch Long.
- 8 p.m. Conversazione in the Royal Technical College, by invitation of the Glasgow Section.

Saturday, July 8

- 9.20 a.m. Visit to Nobel's Explosives Co., Ltd., Ardeer. Luncheon by invitation of Nobel's Explosives Co., Ltd. Demonstration of explosives. Train will leave St. Enoch Station at 9.20 a.m. arriving at Ardeer about an hour later. Members will arrive back in Glasgow about 6.20 p.m.

Monday, July 10

- 10.10 a.m. Visit to the Trossachs. Train leaves Glasgow at 10.10 a.m. for Callander, motor to Trossachs. Luncheon at Trossachs Hotel. Steamer to Stronachlachar, coach to Inversnaid, steamer to Balloch, train to Glasgow, arriving at 7.40 p.m.

Tuesday, July 11

- Visit to Edinburgh. Places of historical interest. Luncheon. University, new chemical laboratories, and Forth Bridge.

Dr. Charles L. Parsons**A Visit and a Chat about Chemicals**

THERE is at present something like an invasion of this country by distinguished American and Colonial visitors associated with chemical industry, and we have had at THE CHEMICAL AGE offices a stream of callers whom it has been a pleasure to welcome. A prominent figure among these was Dr. Charles L. Parsons, Secretary of the American Chemical Society, who left London on Monday for Lyons with the American delegation to the International Union. He was, of course, not allowed to leave Bouverie Street without paying the penalty of disclosing his views on a few matters of current interest.

"Like yourselves," he said, "we are very much interested in the dyestuffs problem, and sincerely hope that in both Britain and America the industry will be put on a sound basis, for it is of basic importance to both nations. As regards the fine chemical industry, we have reached the stage when we are producing most of the fine chemicals used in America. Very few substances indeed have now to be imported from Germany, whether organic or inorganic, or synthetic drugs. The quality of American chemicals is now regarded as superior to those from Germany. There has been a great depreciation in the quality of German chemicals as compared with the pre-war standard, and several firms who have imported them are disappointed with the results."

"Then the position in America is satisfactory?"

"Satisfactory," was the reply, "so far as our being able to supply our chief needs, but not completely satisfactory yet as regards assurance for the future against competition from Germany, aided by cheap labour and the depreciation of the mark. This matter is now being threshed out, and it is hoped that the result will be the adoption of the proposed embargo. While in England you may have importers anxious to re-introduce German products; in America a great many of the important firms are not merely German agents but are Germans themselves, and it is well known that a very vigorous German propaganda has been going on. That, however, has reacted against the people who set it in motion. Though it was organised against the dyestuffs industry, the need of an

embargo has, on the contrary, been made more clear by the evidence adduced which has given the dyestuffs industry and the chemical foundation an absolutely clean bill of health and shown that there is no such thing as a dyestuffs monopoly in America. With you, as with us, the dyestuffs industry is absolutely essential, and we wish those who are engaged in establishing it here every success.

"Chemical business in America," added Dr. Parsons, "is improving, but we have gone through a very difficult time, and although progress is slow it is very welcome, and we hope from now on for a steady advance."

Asked as to the position of the American Chemical Society, Dr. Parsons remarked "Our Society has passed the lowest point of the curve and is now pulling up again. The great success of our Society is due absolutely to the strong spirit of co-operation that exists among American chemists—what we call the 'get together' feeling. They feel that if the standing of the profession is to be maintained it is incumbent upon them to support the Society, and they are doing it with complete loyalty and with excellent results to the Society and its work. We are all working together most happily."

On being informed that the Editor of THE CHEMICAL AGE was arranging to visit New York during October as the representative of Benn Brothers, Ltd., at an important Anglo-American Conference of Trade and Technical publishing houses, Dr. Parsons replied: "I am delighted to hear it, and sincerely hope that you will visit us in Washington, where you will be assured of a hearty welcome. Your journal is very well known among us, and we find it extremely helpful in keeping us in touch with chemical movements in this country."

Dr. Ellwood Hendrick

ANOTHER welcome visitor to England is Dr. Ellwood Hendrick, consulting editor of *Chemical and Metallurgical Engineering*, New York, who has already made himself a popular figure at the Chemical Industry Club. Dr. Hendrick, who has come over to spend the summer in this country, will represent the American Section of the Society of Chemical Industry at the annual meeting in Glasgow next week. His last visit to us was paid in 1879, and he finds practically a new England since then. Already he has been much struck by the similarity between the problems which both Great Britain and the United States have to face, particularly in connexion with such matters as dyestuffs and fine chemicals. He wants, however, a fuller opportunity of studying conditions before offering any definite opinions. His present attitude is represented by a very comprehensive phrase: "Everything here looks good to me, and I am expecting an interesting and happy time."

"Seaside and Countryside"

UNDER the title of *Seaside and Countryside in East Anglia* (6d., pp. 64), the Great Eastern Railway Co. publish a really charming little handbook to the many pleasant East Coast resorts which the line serves. Edited by Percy Lindley, liberally illustrated by black-and-white drawings and reproductions in colour of water-colour sketches, and containing just enough of light gossip descriptive matter to excite a desire for a closer acquaintance, the volume is worth study as an example of cultivated taste in advertising. Well known as the middle East Coast already is through the excellent Great Eastern services, there are many delightful spots lying between the coastal points of Hunstanton and Southend-on-Sea of which too little is known. Here one gets glimpses of seaside sands, cliffs, moorland golf courses, harbours and ferries, lazy inland streams made for holiday yachting, modern and fashionable sea-front promenades, and quiet beautiful old places and buildings that satisfy one's sense of age and restfulness. The variety of choice will surprise even those who know the Great Eastern area already, and should add appreciably to the number of those who once a year, and as often as possible between, escape to these pleasant retreats. The Great Eastern pre-war services were known for their comfort, speed, and economy, and for the present season, it is satisfactory to learn, they have been practically restored. Copies of the booklet may be obtained at the company's offices and agencies, or from the Publicity Department, Liverpool Street Station, E.C.

National Physical Laboratory

Annual Inspection by the General Board

At the annual inspection by the General Board at the National Physical Laboratory, Teddington, on Tuesday, the guests, who numbered between 800 and 900, were received by Professor Sir Charles S. Sherrington, President of the Royal Society, and Professor Sir Joseph E. Petavel, Director of the Laboratory. Among those who had accepted invitations to attend were: Professors J. W. Hinchley, L. Bairstow, F. J. Cheshire, W. H. Merrett, J. W. McBain, A. W. Porter, J. F. Thorpe; Drs. C. C. Carpenter, A. E. Dunstan, W. H. Hatfield, C. H. Lander, H. Levinstein, P. Chalmers-Mitchell, G. W. Monier-Williams, Harold Moore, W. R. Ormandy, J. H. Paterson, J. N. Pring, W. R. Schoeller, Alexander Scott, E. V. Sidgwick, J. B. Thole, M. W. Travers, W. E. S. Turner, D. F. Twiss, J. A. Voelcker, and C. R. Young; Sir Frederick Black, Major A. McN. C. Cooper-Key, Sir Robert Hadfield, Sir Thomas Holland, Sir Archibald Reid, Sir Robert Robertson, Sir Thomas Rose; and Messrs. N. H. Apthorpe, P. W. L. Ashley, Julian L. Baker, E. Richards Bolton, F. H. Carr, A. Chaston Chapman, E. H. Cunningham Craig, M. Dunbar, A. W. Eastlake, A. V. Elsdon, B. S. Evans, E. V. Evans, H. E. Field, H. G. Jarrow, A. Gates, J. F. Halpin, J. Hanley, F. Simeon, G. N. Huntley, S. N. Jenkinson, G. S. W. Marlow, R. Miall, R. L. Mond, G. H. Perry, R. B. Pilcher, W. F. Reid, P. A. E. Richards, G. Stubbs, W. L. Sutton, G. Rudd Thompson, F. Twyman, W. J. U. Woolcock, M.P., A. J. Chapman, J. H. B. Jenkins, and F. Toller.

There were numerous special exhibits in the various departments, among which may be mentioned a differential refractometer for liquids, having nearly the same refractive index, and an arrangement for measuring the internal diameter of glass tubes by immersing in a liquid of the same refractive index to eliminate refraction by the walls. In the latter measurement the difficulty of mixing a liquid of precisely correct index is obviated by employing a mixture of high dispersive power and a monochromatic illuminator. A mixture of approximately correct strength is made up, and the wave length of the light is adjusted to obtain equality of index.

Colour-Measuring Apparatus

Various instruments for the measurement and specification of colour were shown. These included a Nutting monochromatic colorimeter, by Hilger, a Lovibond tintometer of improved pattern, a Bawtree tri-chromatic colorimeter, and a tri-chromatic colorimeter, for standardisation purposes, designed and constructed at the Laboratory. In the latter instrument the mixing of the primary colours is accomplished by a rotating periscopic prism which passes rapidly in front of three stationary sectorial openings of variable angle, in which the red, green and blue filters are placed. The filters have been carefully selected to give highly saturated yellows and blue-greens, while provision is also made for the addition, where necessary, of white light to desaturate any colour under test which is of greater saturation than the most saturated colour given by the primaries. Other exhibits in the optics division of the Physics Department were apparatus for measuring internal diameters of tubes, polarimetric and saccharimetric equipment.

In the heat division of the Physics Department were to be seen hygrometer testing apparatus, thermometer testing baths to cover the range—80°C. to 450°C. apparatus for investigating convection in transformer oils, etc., while in the Radiology Division were shown apparatus for the measurement of radium salts and for standardising barium platino-cyanide pastilles.

Metallurgical Exhibits

The exhibits in the Metallurgy Department were of an interesting character, and included a remarkable demonstration of the spontaneous generation of heat in quenched aluminium-zinc alloys. A multiple thermo-couple for detecting small temperature changes was shown in operation, together with a high-temperature thermostat arranged for obtaining very slow rates of cooling, and a relay for controlling furnace currents. In the Aeronautical Chemistry Division were seen a constant humidity chamber for fabric testing, and a viscosity method for characterising the deteriorations of fabric. A new recuperative gas-air glass melting furnace was shown in operation in the foundry.

The Metrology Department contained an exhibition of standard weights, and methods and apparatus used in testing engineers' gauges were shown. The standards used for length include end gauges up to 36" in length. These standards were made at the Laboratory, and have end faces that are flat and parallel to two or three millionths of an inch. The measuring machines on which these gauges are standardised were also designed and made at the Laboratory, and the magnification of the apparatus is such that a millionth of an inch is indicated.

Chinese Chemists' Organisation

THE American Chemical Society may be the parent of a future "Chinese Chemical Society," according to information from Dr. Robert E. Swain of the Department of Chemistry, Stanford University, California. At a meeting of Chinese chemistry students in the University of California and Stanford University, held at Stanford University recently, steps were taken to bring together into one organisation all the Chinese students engaged in work in chemistry and chemical engineering in the American universities. The purpose of the organisation, which will be known as "The Chinese Students' Chemical Association," is to bring all Chinese engaged in work in chemistry in America into more intimate relationship professionally and socially; to encourage a wider interest in the study of chemistry by the Chinese students at home and abroad; and to promote a higher appreciation of the place of chemistry in the growth of the Chinese nation and the advancement of its people.

Mr. Stanley Baldwin on British Fine Chemicals

AFTER examining the exhibition of fine chemicals at Caxton Hall, Westminster, on June 22, Mr. Stanley Baldwin, President of the Board of Trade, said he did not think that anyone in England was foolish enough to believe that our fine chemical industry should not be protected. He characterised the exhibition as the most amazing he had ever seen, and a revelation to business men of the ability of British chemists. The progress they were making and the way in which they were holding their own against foreign competition was striking indeed. They were comparative newcomers, yet already in many instances they were beating, in the quality of their products, their German rivals.

Tariff Changes

JAMAICA.—A new preferential Customs Tariff affects explosives, cement, matches, oils, soaps, salt, &c. Details of the new rates were published in the *Board of Trade Journal* of June 22 (page 708).

MOZAMBIQUE.—Under a new Tariff, perfumes and essential volatile oils for use exclusively in the manufacture of soap, including fancy soap, are dutiable at the rate of 10 per cent., *ad valorem*.

LATVIA.—It is stated that the application of the new Tariff which came into force on June 2, will result in a reduction of the amount of duty hitherto payable. Particulars of the new duties may be obtained from the Tariff Section Department of Overseas Trade, 35, Old Queen Street, London.

SWITZERLAND.—Sulphate of Copper may be imported into Switzerland without authorisation as from June 15.

Recent Wills

| | |
|---|------------|
| Sir John Williams Benn, of Stonewall, Limsfield, Surrey, Chairman of Benn Brothers, Ltd., proprietors of THE CHEMICAL AGE | £7,375 |
| Mr. George Cussons, of Nythfa, Llysfaeb, Carnarvon, founder and principal of George Cussons, Ltd., scientific apparatus manufacturers | £17,382 |
| Mr. Edmund Vannutelli Salaman, of Egerton House, Egerton Park, Rock Ferry, Birkenhead, a director of Lever Brothers, Ltd., and chairman of the Vinolia Co., Ltd. | £25,468 |
| Baron Manton, of Compton Verney, Warwickshire, better known as Mr. Joseph Watson, of Joseph Watson and Co., Ltd., Whitehall Soap Works, Leeds ("so far as at present can be ascertained") | £1,000,000 |

Chemical Matters in Parliament

Repayment of Duties

M. R. FOOT (House of Commons, June 19) asked the President of the Board of Trade whether he was aware that importers who had paid duties on commodities afterwards removed from the list of articles dutiable under Part I. of the Safeguarding of Industries Act had been refused repayment of the duties direct, but could obtain a refund of the duties as duties paid on re-exports if they shipped the articles to, say, Rotterdam and back; and whether, in these circumstances, he would obtain powers, if necessary, to repay such duties at once without compelling traders to incur the unnecessary expense referred to.

Sir John Baird said the facts were substantially as stated in the question, except that drawback was only payable if the goods exported had not been used in this country. As the Chancellor of the Exchequer had several times stated, he was not prepared to promote legislation to authorise repayment of the duty paid on goods afterwards removed from the list.

Importation of German Chemicals

Dr. Murray (House of Commons, June 19) asked the President of the Board of Trade whether, in view of the statement by the Dean of the Faculty of Science in University College, London, that certain chemicals were unobtainable in this country, and had to be imported from Germany and duty paid on them, he would consider the expediency of seeking powers to exempt such chemicals from the operation of the Safeguarding of Industries Act.

Mr. Baldwin said his attention had not previously been called to the particular statement mentioned, but he was aware that certain chemicals were not at present manufactured in this country—a fact which was, of course, one of the main reasons for the enactment of the Safeguarding of Industries Act. He would remind Dr. Murray that the particular aspect of the matter to which he had drawn attention was fully discussed during the passage of the Act, and that an amendment giving the powers which he now suggested did not meet with the approval of the House.

Anglo-Persian Oil Co.

The Standing Committee "B" met (House of Commons, June 20), to consider the Bill to provide money for the payment of calls on share capital in the Anglo-Persian Oil Co., Ltd., and to amend that law with respect to the application of dividends or interest on capital held in the company. The Bill was ordered to be reported without amendment to the House.

French and American Chemicals

Sir J. Baird (House of Commons, June 20) informed Mr. Kiley that in the case of the amount of £28,830 collected under the Safeguarding of Industries Act in respect of goods consigned from France, during the period October, 1921, to May, 1922, inclusive, the principal articles were optical glass and elements, optical instruments and fine chemicals. Of the amount of £38,177 collected in respect of goods consigned from the United States of America, the principal articles were fine chemicals, scientific instruments, optical glass and elements, optical instruments, wireless valves and similar rectifiers, and vacuum tubes.

Perfumes and Spirits Duty

In reply to Major Kelley (House of Commons, June 20), Sir J. Baird said the Chancellor of the Exchequer was not aware that a firm of perfumery manufacturers, which for many years used an average of 6,000 gallons of alcohol yearly, only purchased 100 gallons in four months this year owing to the rise in the cost of spirit used in perfumery from 20s. per gallon in 1914 to £6 per gallon now; nor that this firm had been forced to dismiss 60 skilled employees. A new clause dealing with this question would be moved in the Debate on the Committee Stage of the Finance Bill.

Gretna Factory

Answering Major C. Lowther (House of Commons, June 20), Sir J. Baird said that no satisfactory offer had as yet been received for the Gretna factory as a whole.

Safeguarding Act Administration

Replying to Captain Wedgwood Benn, who drew attention to a resolution passed by the Imperial Commercial Association asking that the Government should set up a Commission to inquire into the working of the Safeguarding of Industries Act, Mr. Baldwin (House of Commons, June 22) said that as Part I. of the Act had been in operation for less than nine months, and no order had as yet been made under Part II.; such an inquiry would be premature, and the Government were not prepared to adopt the suggestion.

Safeguarding Act-Inquiries

Replying to Captain Wedgwood Benn (House of Commons, June 26) Sir W. Mitchell-Thomson said the terms of reference to Committees appointed under Part II of the Safeguarding of Industries Act had, in accordance with Section 2 (3) of the Act, in all cases included a direction that the Committee should report on the effect which the imposition of a duty would exert on employment in any industry using goods of the description in question as material. As regards the goods covered by the draft Order, the Reports of the Committees indicated that no evidence was offered to lead them to conclude that the imposition of a duty on imports from Germany would affect employment in other industries.

Duty on Naphthalene

Mr. Kiley (House of Commons, June 26) asked the President of the Board of Trade whether naphthalene when imported in the shape of flakes was free of duty, but when imported in ball shape duty must be paid; and whether he could further state what action could be taken by the importer to obtain a refund of the sum he was compelled to deposit before delivery of naphthalene in ball form could be obtained, seeing that H.M. Customs refused to return the same.

Sir W. Mitchell-Thomson said that with regard to the first part of the question, he would refer Mr. Kiley to the answer which he gave him on June 20, and with regard to the second part, he would direct his attention to Section 1 (5) of the Safeguarding of Industries Act.

Scientific and Optical Instruments

Sir W. Mitchell-Thomson, in reply to Dr. Murray (House of Commons, June 26), said he had seen the statement made by Major A. G. Church, D.S.O., general secretary of the National Union of Scientific Workers, before the Committee under the Safeguarding of Industries Act. In his opinion the statement appeared to be based on the assumption that all difficulties of the kinds mentioned were due to the operation of the Safeguarding of Industries Act, and took no account of the change in the cost of all commodities, and also in industrial conditions in Germany which had resulted in abnormal delay in delivery and a lower standard of quality than prevailed pre-war. He was satisfied that British manufacturers were making every effort to improve the quality and reduce the cost of their products, and sympathetic co-operation with them on the part of men of science would expedite that process and be to the advantage of all concerned.

Fuel Oil

In reply to Mr. L. Malone (House of Commons, June 26) Mr. Bridgeman said he understood that the Anglo-Persian Oil Co.'s refinery at Llandarcy, as at present arranged, would be occupied with the treatment of crude petroleum only. Any extension of it for refining oil produced by the destructive distillation of coal would be a matter for negotiation between the Anglo-Persian Oil Co. and colliery interests.

Lead Poisoning

Mr. Shortt informed Mr. Sitch (House of Commons, June 26) that the number of cases of lead poisoning for the three years 1919 to 1921 showed an increase on the figures for the two years 1917 and 1918, but in those two years the industry was on a war footing and conditions were abnormal. The average for the last three years was practically the same as for the years 1914 to 1916, and much lower than the average for the three years preceding the war. After an exhaustive inquiry by a Departmental Committee, a new code of regulations for the industry was brought into operation in 1913, and since then there had been a great reduction in the number of cases.

From Week to Week

SLIGHT DAMAGE was caused by fire last week at the chemical works of Turnbull and Co., Great Eastern Road, Glasgow.

The United States War Department announces that it has sold 16,450 short tons of SODIUM NITRATE in 79 lots at an average price of \$38.44.

A message from Melbourne states that Mr. W. G. DUNCAN is joining the board of the Broken Hill Proprietary Co., Ltd., in place of the late Mr. D. E. McBryde.

The death occurred at Kuala Lumpur on June 24 of Mr. LAWRENCE LEWTON-BRAIN, scientific adviser and Director of Agriculture in the Federated Malay States.

Employed for nearly forty years by B. HEPPWORTH AND CO. LTD., chemical manufacturers, Kidderminster, Mr. George Owen, a 70-year-old carter, died on June 23.

Mr. G. A. COWIE, M.A., B.Sc., chief agricultural adviser in Great Britain to the Potash Syndicate, has been elected a Fellow of the Institute of Chemistry of Great Britain and Ireland.

SIR WILLIAM ALEXANDER, chairman of the British Dyestuffs Corporation, Ltd., has been invited to address the members of the Parliamentary Commercial Committee at the House of Commons on July 5.

Originating in an elevator, a fire at the works of BARTON'S SEED CRUSHING MILLS, LTD., Hull, caused serious damage to the premises and destroyed many tons of oil-cake. Large tanks of cotton-seed oil were saved.

Damage roughly estimated at £1,000 was caused by fire on June 21 at the works of the BRITISH PHENOIDS Co., Irvine. The fire started in a tank containing about 3,000 gallons of a highly inflammable liquid.

The Board of Trade have appointed Mr. WILLIAM J. CUMBER, in the place of Mr. T. H. Ryland (resigned), to be an additional member of the Permanent Panel from which Committees under Part II. of the Safeguarding of Industries Act are selected.

Reprints of the address given by Mr. F. W. Sanderson before the NATIONAL UNION OF SCIENTIFIC WORKERS immediately before his death, will be published shortly. Copies may be obtained on application to the General Secretary of the Union, at 25, Victoria Street, London.

MME. ERNEST SOLVAY and the remaining members of her family return thanks for the many expressions of sympathy they have received on the death of M. Ernest Solvay. They regret the impossibility of thanking individually all those who have so kindly written to them.

We have received the report of the Council of the COLOUR USERS' ASSOCIATION for the year ended April 30. It discloses a very satisfactory year's work and a sound financial position. Owing to pressure on our space, our abstracts from this report are held over until next week.

MR. DAVID R. DAWKINS, A.I.C., of Skewen, has been granted the degree of M.Sc. by the University of Wales for a thesis bearing upon investigations carried out while holding a post-graduate research scholarship at the South Wales and Monmouthshire University College, Cardiff.

The Japanese Soda and Bleaching Powder Manufacturers' Association is reported to have decided to maintain a 65 per cent. restriction upon its members' output, on the ground that the MARKET FOR SODA and bleaching powder is unfavourable, and that the stock in hand is too heavy for the season.

It is announced that Earl Haig is to join the board of the DISTILLERS' COMPANY next month, and will also shortly resume his seat on the board of John Haig and Co., Ltd., which he vacated in 1919. Lord Haig's family has been connected with the Distillers' Company ever since its incorporation in 1877.

THE MARRIAGE was solemnised on Wednesday, at St. Paul's Church, Knightsbridge, London, between Mr. Harold S. Glendening, a chemistry student at Oxford, and Miss Alicia du Pont, daughter of Mr. Alfred I. du Pont, of Wilmington, Delaware, president of the famous du Pont powder company.

The Canadian Minister of Mines recently announced the opening of a vigorous campaign for the development of a MARKET for CANADIAN MINERALS in Great Britain and Europe. The Deputy Minister of Mines is understood to be leaving for England to take up the subject with the Imperial Mining Resources Bureau.

An alleged nuisance arising from offensive fumes from the ELECTRIC CHEMICAL WORKS was discussed at the last meeting of the Barnet Rural Council, when the Clerk was instructed

to draw the company's attention to the fact that, despite the stoppage of the digester, which was originally complained of, the nuisance had not been abated.

In the King's Bench Division on June 23, Mr. Justice Rowlatt gave judgment for the defendants in an action brought by Joseph Watson and Sons, Ltd., who claimed £3,706 19s. 7d., and interest under three certificates of insurance by the Firemen's Fund Insurance Co., of San Francisco, for a quantity of barrels of rosin damaged by steam on a voyage from New York to Hull.

Presiding on Wednesday at the annual meeting of J. C. and J. FIELD, LTD., the Chairman (Sir H. S. Samuel, M.P.) said that owing to the conservative policy of the board the Company was able to tide over a very difficult year without any untoward result. There was, he thought, a greater note of optimism abroad regarding trade prospects. There was no doubt, however, that the present heavy taxation was a severe handicap to trade.

It is reported that oil treatment for tuberculosis is being carried out with encouraging results by Sir Leonard Rogers, F.R.S., whose chaulmoogra oil injections against leprosy are claimed to have been followed by permanent cures in India, Hawaii, China and the Philippines. He has prepared from the fatty acids of cod liver oil an injection known as SODIUM MORRHUATE, which is said to be more effective than the chaulmoogra injections.

At Liverpool Assizes on Monday, before the Lord Chief Justice, a verdict of "NOT GUILTY" was returned in the case of Mr. E. E. P. Edwardson, who was charged with stealing documents, formulæ and other articles, the property of Vickers, Ltd., chemical manufacturers, St. Helen's. Mr. H. D. S. Stead, a chemist formerly employed by the firm, said that scientifically the lists which had been referred to were of no value; commercially they were only of value as lists of customers. They did not contain any secret formulæ.

The question of America's share of GERMAN REPARATION DYES has been taken a step further by the introduction in the Senate of a resolution authorising the President to take steps to secure for the United States the dyestuffs and chemicals to which she is entitled under the Treaty of Versailles. It will be recollected that, in the absence of a renewal of the authorisation to receive such dyes the Reparation Commission had been considering what course should be followed when the present arrangement lapsed on June 30.

About 500 members of the INSTITUTION OF GAS ENGINEERS and some fifty members of the Société Technique de l'Industrie du Gaz en France, on June 23, visited the Becton works of the Gas Light and Coke Company. Apart from the professional interest of the occasion there was a touching little ceremony at the monument which stands within the grounds of the works in memory of the 500 employees who lost their lives in the war. At the base of this memorial, in the presence of an appreciative assembly, a beautiful wreath was deposited on behalf of the French gas engineers.

THE RUBBER GROWERS' ASSOCIATION understand that the result of the meeting of the International Association for Rubber Cultivation in the Netherlands Indies held at The Hague on Tuesday was a three-fourths majority in favour of Government assistance in the difficult position of the industry. Advocates for Government assistance, by way of control, support restriction and stabilisation of rubber output through the co-operation of the Malaya, the Dutch Indies, and Ceylon. Forced restriction, however, is opposed by several Amsterdam companies, who have asked the Dutch Government to reject any scheme for compulsory reduction.

The Commissioners of 1851 have appointed Mr. J. SYBRANDT BUCK, research student in chemistry of the University of Liverpool, to a Senior Studentship for 1922. The scheme of Senior Studentships is intended to give a few selected students of exceptional promise and proved capacity for original work the opportunity of devoting their whole time for a period of not less than two years to the prosecution of scientific research. The Studentships are of the value of £400 per annum (with additional allowances). The awards are made by selection from among candidates under thirty years of age, who are recommended to the Commissioners through the executive authorities of institutions invited to make recommendations. The student is required to devote himself to research in "some branch of pure or applied science."

References to Current Literature

British

- ARTIFICIAL SILK.**—Progress in the artificial silk industry. E. Bronnert. *J. Soc. Dyers and Col.*, June, 1922, pp. 153-162.
Dyeing of cellulose acetate silk. W. E. Sanderson. *J. Soc. Dyers and Col.*, June, 1922, pp. 162-165.
Dyeing viscose silk. Part I. G. Emmons. *Dyer*, June 15, 1922, p. 227.
The dyeing of acetyl silk. Part I. C. Raglan. *Dyer*, June 1, 1922, pp. 206-207.
- ANTHRAQUINONE.**—Anthraquinone and its derivatives. E. Greenhalgh. *Dyer*, June 15, 1922, pp. 228-229.
- ATOMS.**—Magnetism and atomic structure. Part II. The constitution of the hydrogen-palladium system and other similar systems. A. E. Oxley. *Roy. Soc. Proc.*, June, 1922, pp. 264-279.
- DYESTUFFS.**—Synthetic dyes as antiseptics and chemotherapeutic agents. C. H. Browning. *Nature*, June 10, 1922, pp. 750-751.
- ORGANIC TIN COMPOUNDS.**—The preparation and properties of organic stannous and stannic chlorides. Part IV. Some diamine stannic chlorides. J. G. F. Druce. *Chem. News*, June 2, 1922, pp. 310-313.
- CERAMICS.**—The melting of glass. General discussion. *J. Soc. Glass Technol.*, May, 1922, pp. 3-17.
The action of various analytical reagents on chemical glassware. W. E. S. Turner and T. E. Wilson. *J. Soc. Glass Technol.*, May, 1922, pp. 17-20.
Solubility and decomposition in complex systems. G. W. Morey. *J. Soc. Glass Technol.*, May, 1922, pp. 20-29.
An examination and extension of Zulkowski's theory of the relation between the composition and durability of glasses. W. L. Baillie. *J. Soc. Glass Technol.*, May, 1922, pp. 68-101.
- LEATHER.**—Chrome tanning. Part IX. The relation between the properties of chrome liquors and the leather they produce. Some notes on the mechanism of chrome tanning with bibliography. D. Burton. *J. Soc. Leather Trades' Chemists*, May, 1922, pp. 157-180.
A critical study of bating. J. A. Wilson and G. Daub. *J. Soc. Leather Trades' Chemists*, May, 1922, pp. 180-191.
- ORGANIC SULPHUR COMPOUNDS.**—Dehydrothiolutidine; its isomers, homologues, analogues and derivatives. M. Meyer. *Chem. News*; Part I., June 2nd, 1922, pp. 319-323; Part II., June 9, pp. 328-330; Part III., June 16, 1922, pp. 344-346.
- United States**
- DISTILLATION.**—Symposium on distillation.—The efficiency and capacity of fractionating columns; the plate efficiency of a continuous alcohol still; the simple distillation of hydrocarbon mixtures; the molal entropy of vaporisation as a means of determination of heats of vaporisation; determination of heats of vaporisation from vapour pressure data; present practice of dynamite and chemically pure glycerol distillation; wood turpentine; benzene purification. *J. Ind. Eng. Chem.*, June, 1922, pp. 476-492.
The efficiency and design of rectifying columns for binary mixtures. W. K. Lewis. *J. Ind. Eng. Chem.*, June, 1922, pp. 492-497.
- ELECTRO-CHEMISTRY.**—An electrochemical study of the reversible reduction of organic compounds. J. B. Conant, H. M. Kahn, L. F. Fieser and S. S. Kurtz. *J. Amer. Chem. Soc.*, June, 1922, pp. 1382-1396.
Geographical aspects of the electrochemical industry. W. S. Landis. *Chem. Age (N. York)*, May, 1922, pp. 207-209.
- OXYGEN.**—Oxygen production by the Claude process. *Chem. Age (N. York)*, May, 1922, pp. 215-216.
- DRUGS.**—Synthetic medicinal chemical manufacture in America. A. S. Burdick. *Chem. Age (N. York)*, May, 1922, pp. 221-223.
- OILS.**—The composition of soya bean oil. W. B. Smith. *J. Ind. Eng. Chem.*, June, 1922, pp. 530-531.

- GAS PURIFICATION.**—Purification of gases from methane. G. R. Fonda and H. N. Van Aernem. *J. Ind. Eng. Chem.*, June, 1922, pp. 539-540.
The elimination of industrial organic odours. Y. Henderson and H. W. Haggard. *J. Ind. Eng. Chem.*, June, 1922, pp. 548-551.
- ANALYSIS.**—Glacial acetic acid method for determining uranium in carnotite. W. W. Scott. *J. Ind. Eng. Chem.*, June, 1922, pp. 531-532.
Methods for the analysis of rubber goods. *J. Ind. Eng. Chem.*, June, 1922, pp. 560-564.
- GENERAL.**—The business side of chemical manufacturing. Part IV. C. Wadsworth. *Chem. and Met. Eng.*, June 7, 1922, pp. 1064-1068.
Handling the finished products of industry. Part III. G. L. Montgomery. *Chem. and Met. Eng.*, June 14, 1922, pp. 1114-1118.
- AMMONIUM NITRATE.**—The manufacture of ammonium nitrate. E. M. Symmes. *Chem. and Met. Eng.*, June 7, 1922, pp. 1069-1074.
- FULLER'S EARTH.**—Commercial preparation and use of Fuller's earth. T. P. Maynard and L. E. Mallory. *Chem. and Met. Eng.*, June 7, 1922, pp. 1074-1076.
- COAL.**—Froth flotation tests on bituminous coking coal. O. C. Ralston and G. Yamada. *Chem. and Met. Eng.*, June 7, 1922, pp. 1081-1086.
- HYDROGEN PEROXIDE.**—Hydrogen peroxide—a novel process for its manufacture. H. A. Doerner. *Chem. and Met. Eng.*, June 14, 1922, pp. 1111-1112.
- CATALYSIS.**—The use of the oxides of platinum for the catalytic reduction of organic compounds. Part I. V. Voorhees and R. Adams. *J. Amer. Chem. Soc.*, June, 1922, pp. 1397-1405.
- DYESTUFFS.**—Properties and application of logwood. Part I. J. F. Springer. *Color Td. J.*, June, 1922, pp. 236-237.
Dyeing of fast chrome colours. L. G. Hayes. *Color Td. J.*, June, 1922, pp. 253-258.
- COLLOIDS.**—The electrical precipitation of colloids. C. H. Hall. *J. Amer. Chem. Soc.*, June, 1922, pp. 1246-1249.

German

- ORGANO-METALLIC COMPOUNDS.**—Zinc-containing products of the addition compounds of nitrogen oxides and olefines. A. Schaarschmidt, M. Veidt and F. Schlosser. *Ber.*, May 13, 1922, pp. 1103-1112.
Fluorides of organo-metallic compounds. Part II. Alkyl- and aryl-lead fluoride. E. Krause and E. Pohland. *Ber.*, May 13, 1922, pp. 1282-1289.
- ANALYSIS.**—The analysis of chlorosulphonic acid. G. Weissenberger and A. Zoder. *Z. anal. Chem.*, 1922, No. 1, pp. 41-48.
The estimation of hydrochloric acid split off from organic compounds. J. Klimont. *Chem.-Zeit.*, June 10, 1922, pp. 521-522.
- CATALYSIS.**—Catalysis. Part XIV. Action of nitric acid on metals and an example of a periodic reaction. B. C. Banerji and N. R. Dhar. *Z. anorg. u. allg. Chem.*, June 1, 1922, pp. 73-80.
- PHOTO-CHEMISTRY.** Photochemical investigation of the action of ferric salts on iodides. N. Sasaki. *Z. anorg. u. allg. Chem.*, June 1, 1922, pp. 61-72.
- ACIDS.**—Some polyacids of elements of the sulphur group. J. Meyer and V. Stateczny. *Z. anorg. u. allg. Chem.*, June 1, 1922, pp. 1-21.
The formation of hydrocyanic acid from nitrogen and hydrocarbons in the electric arc. A. Koenig and W. Hubbuch. *Z. Elektrochem.*, May, 1922, pp. 202-224.
- HYDRATES.**—The hydrates of tungstic oxide. G. F. Hüttig and B. Kurre. *Z. anorg. u. allg. Chem.*, June 1, 1922, pp. 44-50.
- ELECTRO-CHEMISTRY.**—Investigation of the electrolytic production of sodium perborate. K. Arndt and E. Hantge. *Z. Elektrochem.*, June, 1922, pp. 263-273.
The chemical and electrochemical behaviour of salts of plumbic acid. G. Grube. *Z. Elektrochem.*, June, 1922, pp. 273-289.

Patent Literature

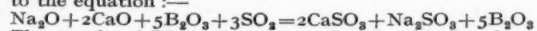
Abstracts of Complete Specifications

180,118. GENERATING HYDROCYANIC ACID, METHOD OF. Deutsche Gold-und-Silber Scheideanstalt vorm. Roessler, and O. Liebknecht, Weissfrauenstrasse 7/9, Frankfurt-on-Main, Germany. Application date, March 15th, 1921.

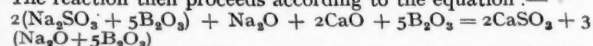
In the process for generating hydrocyanic acid from a solution of metallic cyanide and an acid or acid salt, the heat necessary for liberating the hydrogen cyanide gas is supplied by the hydration heat of the metallic salt itself, or of an auxiliary salt which does not interfere with the reaction. The solid cyanide in a finely divided condition is mixed with an anhydrous or sufficiently dehydrated salt of a metal capable of forming an unstable cyanide. This mixture liberates no gas when dry, but most of the hydrogen cyanide is given off when moistened. As an auxiliary salt, calcium chloride may be used. As an example of the first method, 50 parts of sodium cyanide are mixed with 70 parts of aluminium sulphate containing about 2.5 molecules of water, and this is treated with 120-125 parts of cold water, which liberates hydrogen cyanide gas. The process may be varied by dissolving the cyanide in the water and then adding the dehydrated sulphate. Other salts such as aluminium chloride, or magnesium sulphate or chloride may be used.

180,110. ALKALI PENTABORATES DIRECT FROM BORON ORES, PROCESS FOR THE PRODUCTION OF. A. A. Kelly, 57, Chancery Lane, London, W.C.1, and B. D. Jones, 14, Maitland Park Villas, Haverstock Hill, London, N.W.3. Application dates, March 12th and October 25th, 1921.

Sodium pentaborate is produced by treating the raw or calcined boron ore, such as boronatrocalcite, with a calculated amount of sulphur dioxide, and with water. The reaction is preferably effected in two stages, an excess of sulphurous acid being used in the first stage to produce boric acid according to the equation:—



The supply of SO_2 is then stopped and a calculated quantity of boronatrocalcite added and the mixture heated to boiling. The reaction then proceeds according to the equation:—



The sodium pentaborate may be crystallised immediately from the hot solution, or it may be converted into borax.

180,175. CARBON BISULPHIDE, MANUFACTURE OF. Courtaulds, Ltd., 19, Aldermanbury, London, and A. E. Delph, South View, Gipsy Lane, Wokingham, Berks. Application date, April 23rd, 1921.

When carbon bisulphide is manufactured in cast iron retorts, the metal of the retort is seriously attacked by sulphur at a temperature of about 400°C ., and the sulphide of iron produced diminishes the capacity of the retort and decreases its conductivity. In this invention the retort is coated with metallic aluminium to protect the iron. The coating is effected by partly filling the retort with a mixture consisting of granulated aluminium 93 parts, aluminium oxide 5 parts, and ammonium chloride 2 parts. The retort is then heated to about 800°C . for three hours while a vacuum is maintained within it to prevent oxidation of the aluminium. The retort is then cooled, and, after removal of the surplus mixture, is heated again to 850°C . for 6 hours, giving a firm coating of aluminium.

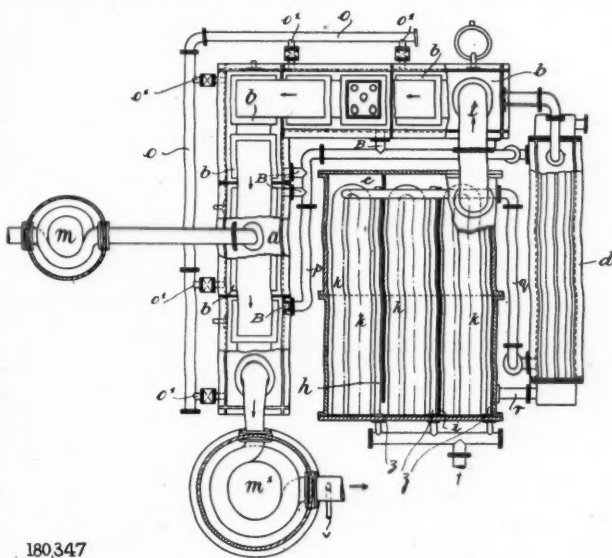
180,180. TREATMENT OF NITRATES, PARTICULARLY THOSE USED FOR FERTILISER PURPOSES. R. G. Browning, "Belswains," New Dover Road, Canterbury, and H. G. T. Boorman, "The Hollies," Victoria Park, Herne Bay, Kent. Application date, April 27th, 1921.

The object is to obviate the tendency for nitrate of sodium or calcium to absorb moisture from the air. It has been found that this tendency is due mainly to the presence of a very small quantity of free acid in the salt, and that it may be avoided by the addition of a non-deliquescent, non-hygroscopic base or mixture of such bases, such as sodium or potassium bicarbonate, or the carbonate of ammonium,

alkaline earth metals, or magnesium. The amount of carbonate added varies from 5 to 15 per cent., and other fertilisers may also be added, such as nitrogenous, potash or basic or neutral phosphatic materials which are non-deliquescent and non-hygroscopic.

180,347. DISTILLATION OF LIQUIDS SUCH AS TAR AND OILS. J. L. Wilson, Apsley House, Heywood Street, Bury, Lancs. Application date, November 17th, 1920.

The object is to subject tar and oils to a continuous distillation so as to obtain a graduated series of products without recourse to fractional distillation. The apparatus is shown in plan in the illustration. A preheater *a* comprises a number



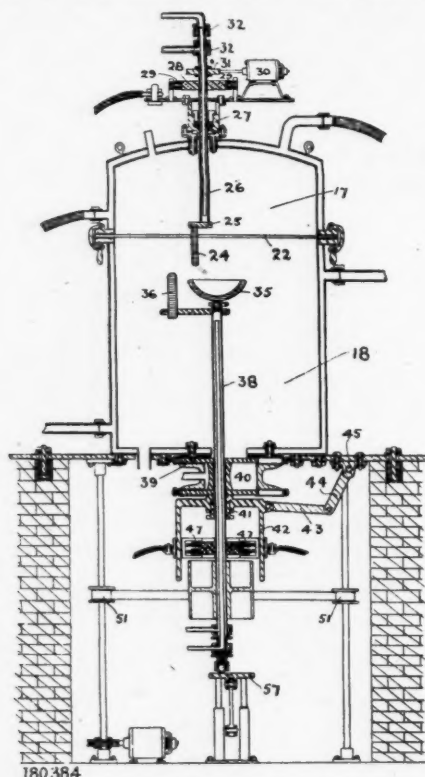
180,347

of condensers *b* connected in series, each condenser having two superposed chambers connected by vertical tubes. A cooler *d* for the residual pitch is of similar construction, having horizontal tubes through which the pitch passes and is cooled by the surrounding tar. The still *c* contains a series of heating coils *k* arranged in sections which are separated by baffle plates *k*, *i*. A water condenser *m* receives the distillate from the preheater *a*, and a condenser *m*¹ receives vapour from the still, which is not condensed in the condensers *b*. Tar is supplied through the pipe *o* and inlets *o*¹ to all the condensers *b*, which are connected in series, and from the condensers through outlets *B* and pipe *p* to the pitch cooler *d*. The tar then passes through the pipe *q* to the still, into which inert gas or steam is blown (through perforated pipes *s*) to carry off the vapour. Vapour passes by the passage *t* to the preheaters through which it passes in series and is fractionally condensed. The pitch passes by a pipe *r* to the cooler *d*¹, the temperature of which is maintained sufficiently high by the hot tar to prevent solidification of the pitch. The preheater and pitch cooler are arranged so as to cover two sides and the back of the still, and the number and dimensions of the condensers determines the number and constitution of the fractions obtained.

180,384. EXTRACTION OF METALS FROM THEIR COMPOUNDS, METHOD OF. P. Freedman, 59, Beresford Road, High-bury, London, N.5, and E. Greetham, 27, Louis Street, Hull. Application date, January 26th, 1921.

The apparatus is particularly suitable for the extraction of rare metals such as zirconium, cerium or uranium from their oxides, nitrides, nitrates, etc., by reduction in a direct current arc furnace. The furnace chamber is divided into two parts 17, 18, which are jacketed and cooled by circulating water. The joint between the parts is made with a leather ring 22 so as to be airtight. An oil-cooled electrode shaft 26 passes through the packing gland 27 which is electrically insulated

from the casing, and electric contact is made through the slip-ring 28 and brushes 29. The electrode shaft is rotated by an electric motor 30 and gearing 31, and the oil is circulated through ring joints 32. The cathode 24 is carried by a radial arm 25 on the lower end of the shaft. The lower part 18 of



the furnace contains the anode crucible 35 mounted on a shaft 38, which is also oil cooled and passes through an airtight chamber 40 and stuffing box 41. The stuffing box is carried by a casting 42 connected by links 43, 44 to a shaft 45 operated by a lever. Current is supplied through the brushes 47. The electrode shaft 38 is supported on a vertically movable table 57 and is driven from pulleys 51. The compound to be reduced is compressed into blocks which are placed in the crucible 35. The furnace is exhausted and then filled with a gas which may be freed from oxygen, or from nitrogen in the case of uranium compounds. In this case, argon or helium may be used. The crosshead 39 is then moved to the right by turning the shaft 45, so as to bring the electrodes 24, 36 into contact to strike the arc. The crosshead 39 is then moved to bring the arc over the crucible to heat it, and the shaft 38 is then raised to bring the cathode 24 into contact with the block of material. The shafts 26, 38 are rotated during the reduction of the material. The electrodes may be formed of a refractory material such as tungsten, carbon or molybdenum, while the crucible may be of fused tungsten.

180,395. WORKING OF SHAFT FURNACES, MORE ESPECIALLY BLAST FURNACES, PROCESS FOR. E. Diepschlag, 25, Promenade, Cothen, Anhalt, Germany. Application date, February 11, 1921.

The process is for supplying materials in the form of dust to a furnace without risk of stopping the injector or choking the tuyeres. It has been found that no choking occurs if the powdered material is supplied under static head. The powdered material is allowed to flow into the hot air nozzle at the bottom of the furnace, through a vertical pipe leading from a container which is placed at such a height that the static head of the powder alone is sufficient to discharge it into the nozzle against the pressure of the hot air. The method is suitable for adding substances such as chromium, nickel or carbide, or fuels such as coke dust.

180,396. FEEDING OF FINE MATERIALS TO SHAFT FURNACES, GAS PRODUCERS AND THE LIKE. E. Diepschlag, 25, Promenade, Cothen, Anhalt, Germany. Application date, February 11, 1921.

A charge of fine material such as ore and/or fuel, which is to be introduced directly into the combustion zone of a shaft furnace or gas producer, is first dried by passing the furnace gases over it. This may be done by placing a drying tube having a rotating screw conveyor into the waste gas flues. An additional source of heat, such as air from pre-heaters, may also be used for drying.

180,447. RESOLVING EMULSIONS, PROCESS FOR. H. A. Gill, London. From The Sharples Specialty Co., 23rd and Westmoreland Streets, Philadelphia, Pa., U.S.A. Application date, March 3, 1921.

It is known that the stability of an emulsion depends on the presence of an emulsifying colloid in it. For example, if the emulsion is oil-in-water, the emulsifying colloid is in the water, but if the emulsion is water-in-oil, the emulsifying colloid is in the oil. The stability of the emulsion is reduced or destroyed by adding an emulsifying colloid of opposite character to that already present, but the difficulty has previously been to secure intimate contact of the added colloid which is not soluble in the continuous medium of the emulsion, so that a very efficient mechanical admixture is necessary. Colloids of this character have now been found which are soluble in the emulsion medium, so that mechanical mixing is unnecessary. A re-agent consisting of about 25 per cent. of sodium soap, 10 per cent. of water, and 65 per cent. of oleic acid is made by adding an excess of oleic acid to an aqueous solution of caustic soda of 30° Bé., and forms an oil soluble colloid which may be used for resolving an emulsion of water-in-oil. A water soluble colloid may be made by dissolving 4 per cent. of calcium oleate in a mixture of equal parts of alcohol and glycirol, and then adding 1 per cent. of gelatine. Examples are given of the resolving of petroleum emulsions by the use of sodium resinate.

180,546. SULPHURIC ACID, MANUFACTURE OF. E. A. Gaillard, 33, Ronda Universidad, Barcelona, Spain. Application date, May 10, 1921.

In the manufacture of sulphuric acid in lead chambers by intensive working, higher temperatures and a higher proportion of nitrous products in the gases are necessary, but serious corrosion of the lead chambers occurs. In this invention corrosion is avoided by spraying the walls continuously with cold sulphuric acid of 50°-54° Bé., so that a thin protecting film is obtained. The lead chamber may be made in the form of a frustum of an inverted cone. A very high yield of acid is obtained.

NOTE.—Abstracts of the following specifications which are now accepted appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention:—159,817 (O. L. Christenson and B. A. Hedman), relating to production of ammonium chloride in distilling or coking coal in coking plant and gasworks, see Vol. IV., p. 567; 160,161 (Kansas City Gasolene Co.), relating to cracking hydrocarbons, see Vol. IV., p. 592; 161,161 (O. L. Christenson and B. A. Hedman), relating to production of ammonium chloride in burning or distilling alum, slate, or similar bituminous shales, see Vol. IV., p. 654.

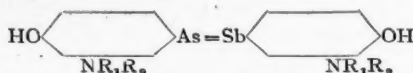
International Specifications not yet Accepted

178,797. BORNEOL AND CAMPHOR. A. Gawalowski, Raitz, Brünn, Czecho-Slovakia, and L. Kutter, 4, Johann Hoffmannplatz, Vienna. International Convention date, April 19, 1921.

Pinene hydrochloride is converted into borneol by treating with calcium hydroxide or boiling water. To produce camphor, pinene hydrochloride is treated with an oxidising agent, such as iron oxide or lead peroxide, and with a "dehydrogenising" agent such as potassium bisulphate or bicarbonate. Borneol may be treated with a peroxide to obtain camphor.

- 178,824. SYNTHETIC DRUGS. H. A. Metz, 122, Hudson Street, New York. (Assignee of C. N. Myers, Valley Falls, N.Y., U.S.A.) International Convention date, April 21, 1921.

The process is for obtaining arseno-stibino compounds having the general formula



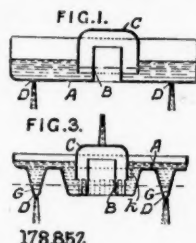
where R_1R_2 represent hydrogen, alkyl, acyl, or the methylene sulphonylate group. The compounds are obtained by reducing mixtures of the corresponding arsenic and stibinic acids or their sodium salts, or mixtures of the nitro-bodies, by the use of tin, stannous chloride, or zinc dust and acid, hypophosphorous or phosphorous acid, or sulphur dioxide and potassium iodide, or sodium hydro-sulphite. Examples are given.

- 178,842. FORMALDEHYDE. Consortium fur Elektrochemische-Industrie Ges., 20, Zielstattstrasse, Munich, Germany. International Convention date, April 18th, 1921.

Acetaldehyde is mixed with oxygen or air, and with or without steam or an indifferent gas, is passed over a heated catalyst consisting of copper, silver, or other metal which forms an easily irreducible oxide. Vanadium or cerium oxides, or other oxides of metals forming several oxides may also be used as catalysts. The products of the reaction are passed into water, and the solution fractionally distilled to separate the unchanged acetaldehyde from the formaldehyde solution.

- 178,852. TREATING LIQUIDS. L'Air Liquide, Soc. Anon. pour l'Etude et l'Exploitation des Procédés G. Claude, 48, Rue St. Lazare, Paris. International Convention date, April 21, 1921.

The device is for bubbling a gas through a liquid in a rectifying column. A tray A is provided with a central passage B projecting upwards and covered by an inverted cup C, so that gas passing upwards through the passage B bubbles through the liquid in the tray. The liquid passes downwards from one column to the next through openings D, which are of capillary size so that liquid adheres around their edges. The downward flow of liquid varies with the supply of gas passing upwards. The liquid capacity of the tray may be reduced by placing the openings D at the lower ends of depend-



178,852

ing cones G, and arranging the cup C to dip into an annular trough in the tray. The cones G must extend below the rim of the cup C.

LATEST NOTIFICATIONS.

- 181,673. Method of effecting caustic fusions. National Aniline and Chemical Co., Inc. June 17, 1921.
 181,674. Production of vat dyestuffs. National Aniline and Chemical Co., Inc. June 17, 1921.
 181,677. Method and apparatus for the treatment of silicates with acids in order to obtain saline solutions free from silica. Blanc, G. A. June 14, 1921.
 181,678. Methods for the treatment of alum with ammonia in order to obtain sulphates of potassium and ammonium and free alumina. Blanc, G. A. June 16, 1921.
 181,698. Method of protecting animal fibre which is treated with alkaline liquids. Akt.-Ges. für Anilin-Fabrikation. June 15, 1921.
 181,719. Process for making prussian blue starting from coal gas. Dessemond, A., and Deleëve, A. H. June 16, 1921.

Specifications Accepted, with Date of Application

- 156,218. Fractional distillation, Apparatus for. E. A. R. Chenard. January 3, 1920.
 156,254. Tanning materials and process of tanning therewith. Chemische Fabriken und Asphaltwerke Akt.-Ges. September 1, 1916.
 157,794. Inferior brown coals and peat, Process for the improvement of. K. W. J. H. Jacobs. July 28, 1919.
 157,795. Fuel capable of application as a gas coal substitute, Process for the production of. J. W. J. H. Jacobs. July 28, 1919.
 159,481. Fertilisers. D. L. Monaco. February 26, 1920.
 161,195. Ammonia, Synthesis of. L'Air Liquide, Soc. Anon. pour l'Etude et l'Exploitation des Procédés G. Claude. April 7, 1920.
 167,144. Cooling and liquefying air and other gases, Process and device for. Heylandt Ges. für Apparatebau and M. von Unruh, July 28, 1920.
 167,738. Separating oils, Process of. Trent Process Corporation. August 11, 1920.
 181,044. Liquids, Filtration of. B. Bramwell. January 6, 1921.
 181,058. Prussic acid, Manufacture of. Deutsche Gold- und Silber-Scheideanstalt vorm. Roessler, and O. Liebnicht. February 7, 1921.
 181,062. Hydrogen, Methods and apparatus for the production of. Cumberland Coal and Chemicals, Ltd., J. H. West and A. Jaques. February 9, 1921.
 181,102. Gas, Treatment of. T. G. Tulloch and D. J. Smith. March 4, 1921.
 181,123. Vacuum filtration of colloidal matter from liquid mixtures. W. Mauss. March 8, 1921.
 181,126. Bituminous shales, Art of treatment. J. H. Ginot. March 9, 1921.
 181,132. Bleaching earthy minerals that in native deposits are stained by colouring matters that render them useless for industrial purposes. A. J. Stubbs. March 12, 1921.
 181,153. Rendering calcium hypochlorite stable, Process for. Chemische Fabrik Griesheim Elektron, and H. Reitz. March 23, 1921.
 181,197. Compounds or mixtures of starch and starchy matter and sulphuric acid, Manufacture and production of. Courtaulds, Ltd., and W. H. Stokes. April 23, 1921.
 181,198. Compounds or mixtures of starch and sulphuric acid, Manufacture and production of. Courtaulds, Ltd., and J. A. Lloyd. April 23, 1921.
 181,239. Lead bearing mattes and the like, Treatment of. F. E. Elmore and Chemical and Metallurgical Corporation, Ltd. June 11, 1921.
 181,247. Isopropylallylbarbituric acid, Process for the manufacture of. H. R. Napp. (F. Hoffman-La Roche and Co., Ltd.)
 181,255. Phosphoric acid, Production of. A. Kelly. July 15, 1921.

Applications for Patents

- J. Y. Johnson and Badische Anilin- und Soda-Fabrik. Process for producing formic acid derivatives. 17032. June 20.
 Bloxam, A. G., and Chemische Fabrik Griesheim-Elektron. Manufacture of azo-dyestuffs. 17272. June 22.
 R. B. Ransford and Cassella & Co., L. Production of dyestuffs containing sulphur. 16927. June 19.
 Chemische Fabrik Weissenstein Ges. Manufacture of hydrogen peroxide. 17381. June 23. (Austria, Aug. 3, 1921.)
 Consortium für Elektrochemische Industrie Ges. Manufacture of esters and ethers of ethyldene-glycol and vinyl alcohol. 16898. June 19. (Germany, June 23, 1921.)
 Marks, E. C. R., and Electro Metallurgical Co. Zirconium alloys, and process of making same. 17261. June 22.
 Whitehall Petroleum Corporation, Ltd., and Greenspan, A., Purification of hydrocarbons. 17273. June 22.
 Whitehall Petroleum Corporation, Ltd., and Munn, J. B. Apparatus for chemically treating mineral oil products. 17158. June 21.
 Turquand, F. J. Means for indicating presence of gas or of acid or alkaline properties in air, water, &c. 17357. June 23.

Market Report and Current Prices

Our Market Report and Current Prices are exclusive to THE CHEMICAL AGE, and, being independently prepared with absolute impartiality by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., may be accepted as authoritative. The prices given apply to fair quantities delivered ex wharf or works, except where otherwise stated. The current prices are given mainly as a guide to works managers, chemists, and chemical engineers; those interested in close variations in prices should study the market report.

LONDON, JUNE 29, 1922.

THERE is little change in the volume of the demand for chemical products, although a substantial turnover in one or two directions is reported.

Taking a broad view prices are on the up grade, due largely to the improved consumption and slackening of Continental competition.

Export trade is rather slow.

General Chemicals

ACETONE for prompt delivery is difficult to obtain, and a considerable advance in price is expected.

ACID ACETIC has been a bright spot, and a substantial turnover is reported. Price firm.

ACID CITRIC is not quite so firm for prompt delivery owing to the arrival of several important parcels. The general situation, however, is unchanged.

ACID FORMIC has been in rather better demand at recent prices. ACID LACTIC is a nominal market.

ACID OXALIC is very slow of sale, and stocks are firmly held. The undertone is firm.

ACID TARTARIC is again firmer, and higher prices are expected as the season advances.

BARIUM CHLORIDE is very scarce, makers being sold out far ahead.

CREAM OF TARTAR is very firm, and some makers are sold out for some time.

IRON SULPHATE is unchanged.

LEAD ACETATE is in better demand at recent values.

LEAD NITRATE has not been in quite such active demand.

LITHOPONE is without special feature.

POTASSIUM CARBONATE is still a weak market.

POTASSIUM CAUSTIC.—Business is of the hand to mouth variety, and is most uninteresting.

POTASSIUM PRUSSATE is again firmer, and the market is practically bare.

SODA ACETATE is fairly active, and price is well maintained.

SODA BICHROMATE is a better market. Foreign makers seem to have a higher idea of values.

SODA NITRITE remains unchanged.

SODA PHOSPHATE still remains rather slow, but the price is maintained.

SODA PRUSSATE has further advanced, and is remarkably scarce.

WHITE LEAD is unchanged.

ZINC OXIDE is in good demand, and the price is unchanged.

Coal Tar Intermediates

Matters continue to progress on quiet lines, but the export market has again been moderately interesting.

ALPHA NAPHTHOL is firm and steady.

ALPHA NAPHTHYLAMINE is quiet.

ANILINE OIL and SALT continue to pass into consumption with a slightly better market for the former. The price is unchanged.

BENZIDINE BASE has been inquired for on export account.

BETA NAPHTHOL is featureless.

BETA NAPHTHYLAMINE.—A small home trade is passing.

DIMETHYLANILINE is unchanged.

DIPHENYLAMINE continues very firm with a fair demand.

"H" ACID has been inquired for, and spot supplies are not excessive.

NAPHTHIONIC ACID.—Rather more orders are in the market.

NITROBENZOL.—The demand is slightly better.

PARANITRANILINE has been inquired for on export account and fair orders have been placed for home trade.

PARAPHENYLENEDIAMINE.—Inquiries chiefly for export have been received.

PHTHALIC ANHYDRIDE has been interesting on export account.

"R" SALT is steady.

RESORCIN.—Orders have been placed for home trade.

XYLIDINE has been inquired for on home account.

Coal Tar Products

The market generally remains steady and fairly active, with few exceptions.

90's BENZOL is very quiet, the value remaining at 1s. 11d. to 2s. per gallon on rails.

PURE BENZOL is steady at 2s. 4d. per gallon.

CREOSOTE is still very firm, and is worth 4½d. to 4¾d. per gallon in the Midlands, and 5½d. to 5¾d. per gallon in London.

CRESYLIC ACID is rather scarce for prompt parcels, the price remaining steady at 2s. 2d. to 2s. 4d. per gallon for the Pale 97/99% quality, and 1s. 10½d. to 2s. per gallon for the Dark 95/97%.

SOLVENT NAPHTHA.—There is no change in the market.

HEAVY NAPHTHA still remains quiet and without change.

NAPHTHALENE remains inactive, at about £5 per ton on rails.

PITCH.—Notwithstanding the lateness of the season, there is still demand for prompt shipment, but makers will only entertain business if they can obtain a full price. To-day's quotations are 75s. f.o.b., London; 70s. to 72s. 6d., f.o.b., East Coast. A few sales have been made for September-December delivery at 2s. 6d. to 5s. per ton below current prices.

Sulphate of Ammonia

The market is very quiet, both for export and for home trade.

Current Prices

Chemicals

| | Per | £ | s. | d. | | £ | s. | d. |
|--|-----|-----|----|-----|----|-----|----|----|
| Acetic anhydride | lb. | 0 | 1 | 8 | to | 0 | 1 | 10 |
| Acetone oil | ton | 77 | 10 | 0 | to | 80 | 0 | 0 |
| Acetone, pure | ton | 73 | 0 | 0 | to | 74 | 0 | 0 |
| Acid, Acetic, glacial, 99-100% | ton | 67 | 0 | 0 | to | 68 | 0 | 0 |
| Acetic, 80% pure | ton | 42 | 0 | 0 | to | 43 | 0 | 0 |
| Arsenic, liquid, 2000 s.g. | ton | 67 | 0 | 0 | to | 70 | 0 | 0 |
| Boric, cryst. | ton | 60 | 0 | 0 | to | 65 | 0 | 0 |
| Carbolic, cryst. 39-40% | lb. | 0 | 0 | 6 | to | 0 | 0 | 6½ |
| Citric | lb. | 0 | 2 | 4 | to | 0 | 2 | 5 |
| Formic, 80% | ton | 65 | 0 | 0 | to | 66 | 0 | 0 |
| Gallic, pure | lb. | 0 | 2 | 11 | to | 0 | 3 | 0 |
| Hydrofluoric | lb. | 0 | 0 | 7½ | to | 0 | 0 | 8½ |
| Lactic, 50 vol. | ton | 40 | 0 | 0 | to | 43 | 0 | 0 |
| Lactic, 60 vol. | ton | 43 | 0 | 0 | to | 45 | 0 | 0 |
| Nitric, 80 Tw. | ton | 30 | 0 | 0 | to | 31 | 0 | 0 |
| Oxalic | lb. | 0 | 0 | 8½ | to | 0 | 0 | 8½ |
| Phosphoric, 1.5 | ton | 38 | 0 | 0 | to | 40 | 0 | 0 |
| Pyrogallol, cryst. | lb. | 0 | 6 | 0 | to | 0 | 6 | 3 |
| Salicylic, Technical | lb. | 0 | 0 | 10½ | to | 0 | 1 | 0 |
| Salicylic, B.P. | lb. | 0 | 1 | 5 | to | 0 | 1 | 6 |
| Sulphuric, 92-93% | ton | 7 | 10 | 0 | to | 8 | 0 | 0 |
| Tannic, commercial | lb. | 0 | 2 | 3 | to | 0 | 2 | 9 |
| Tartaric | lb. | 0 | 1 | 4½ | to | 0 | 1 | 4½ |
| Alum, lump | ton | 13 | 0 | 0 | to | 14 | 0 | 0 |
| Alum, chrome | ton | 28 | 0 | 0 | to | 29 | 0 | 0 |
| Alumino ferric | ton | 9 | 0 | 0 | to | 9 | 5 | 0 |
| Aluminium, sulphate, 14-15% | ton | 10 | 10 | 0 | to | 11 | 0 | 0 |
| Aluminium, sulphate, 17-18% | ton | 11 | 10 | 0 | to | 12 | 0 | 0 |
| Ammonia, anhydrous | lb. | 0 | 1 | 8 | to | 0 | 1 | 9 |
| Ammonia, .880 | ton | 33 | 0 | 0 | to | 35 | 0 | 0 |
| Ammonia, .920 | ton | 21 | 0 | 0 | to | 23 | 0 | 0 |
| Ammonia, carbonate | lb. | 0 | 0 | 4 | to | 0 | 0 | 4½ |
| Ammonia, chloride | ton | 60 | 0 | 0 | to | 65 | 0 | 0 |
| Ammonia, muriate (galvanisers) | ton | 35 | 0 | 0 | to | 37 | 10 | 0 |
| Ammonia, nitrate (pure) | ton | 35 | 0 | 0 | to | 40 | 0 | 0 |
| Ammonia, phosphate | ton | 74 | 0 | 0 | to | 75 | 0 | 0 |
| Ammonia, sulphocyanide | lb. | 0 | 1 | 10 | to | 0 | 2 | 0 |
| Amylacetate | ton | 175 | 0 | 0 | to | 185 | 0 | 0 |

| | | Per | £ | s. | d. | | £ | s. | d. |
|--------------------------------------|----|------|-----|----|-----|----|-----|----|----|
| Arsenic, white, powdered | .. | ton | 42 | 0 | 0 | to | 44 | 0 | 0 |
| Barium, carbonate, 92-94% | .. | ton | 12 | 10 | 0 | to | 13 | 0 | 0 |
| Barium, Chlorate | .. | ton | 60 | 0 | 0 | to | 68 | 0 | 0 |
| Barium Chloride .. | .. | ton | 19 | 10 | 0 | to | 20 | 0 | 0 |
| Nitrate | .. | ton | 27 | 10 | 0 | to | 30 | 0 | 0 |
| Sulphate, blanc fixe, dry | .. | ton | 20 | 10 | 0 | to | 21 | 0 | 0 |
| Sulphate, blanc fixe, pulp | .. | ton | 10 | 5 | 0 | to | 10 | 10 | 0 |
| Sulphocyanide, 95% | .. | lb. | 0 | 1 | 0 | to | 0 | 1 | 3 |
| Bleaching powder, 35-37% | .. | ton | 12 | 0 | 0 | to | — | — | — |
| Borax crystals | .. | ton | 29 | 0 | 0 | to | 33 | 0 | 0 |
| Calcium acetate, Brown | .. | ton | 9 | 0 | 0 | to | 9 | 10 | 0 |
| Grey | .. | ton | 13 | 10 | 0 | to | 14 | 0 | 0 |
| Calcium Carbide .. | .. | ton | 16 | 0 | 0 | to | 17 | 0 | 0 |
| Chloride | .. | ton | 6 | 10 | 0 | to | 7 | 0 | 0 |
| Carbon bisulphide | .. | ton | 50 | 0 | 0 | to | 52 | 0 | 0 |
| Casein, technical | .. | ton | 47 | 0 | 0 | to | 55 | 0 | 0 |
| Cerium oxalate | .. | lb. | 0 | 4 | 6 | to | 0 | 4 | 9 |
| Chromium acetate | .. | lb. | 0 | 1 | 1 | to | 0 | 1 | 3 |
| Cobalt acetate | .. | lb. | 0 | 6 | 0 | to | 0 | 6 | 6 |
| Oxide, black | .. | lb. | 0 | 9 | 6 | to | 0 | 10 | 0 |
| Copper chloride | .. | lb. | 0 | 1 | 2 | to | 0 | 1 | 3 |
| Sulphate | .. | ton | 28 | 10 | 0 | to | 29 | 0 | 0 |
| Cream Tartar, 98-100% | .. | ton | 115 | 0 | 0 | to | 117 | 10 | 0 |
| Epsom salts (see Magnesium sulphate) | | | | | | | | | |
| Formaldehyde, 40% vol. | .. | ton | 68 | 10 | 0 | to | 70 | 0 | 0 |
| Formosol (Rongalite) | .. | lb. | 0 | 2 | 6 | to | 0 | 2 | 9 |
| Glauber salts, commercial | .. | ton | 5 | 10 | 0 | to | 6 | 0 | 0 |
| Glycerine, crude | .. | ton | 65 | 0 | 0 | to | 67 | 10 | 0 |
| Hydrogen peroxide, 12 vols. | .. | gal. | 0 | 2 | 5 | to | 0 | 2 | 6 |
| Iron perchloride | .. | ton | 30 | 0 | 0 | to | 32 | 0 | 0 |
| Iron sulphate (Copperas) | .. | ton | 4 | 0 | 0 | to | 4 | 5 | 0 |
| Lead acetate, white | .. | ton | 42 | 0 | 0 | to | 43 | 0 | 0 |
| Carbonate (White Lead) | .. | ton | 42 | 0 | 0 | to | 46 | 0 | 0 |
| Nitrate | .. | ton | 46 | 10 | 0 | to | 48 | 10 | 0 |
| Litharge | .. | ton | 35 | 10 | 0 | to | 36 | 0 | 0 |
| Lithopone, 30% | .. | ton | 25 | 10 | 0 | to | 26 | 0 | 0 |
| Magnesium chloride | .. | ton | 10 | 0 | 0 | to | 10 | 10 | 0 |
| Carbonate, light | .. | cwt. | 2 | 10 | 0 | to | 2 | 15 | 0 |
| Sulphate (Epsom salts commercial) | .. | ton | 8 | 0 | 0 | to | 8 | 10 | 0 |
| Sulphate (Druggists') | .. | ton | 13 | 10 | 0 | to | 14 | 10 | 0 |
| Manganese, Borate, commercial | .. | ton | 65 | 0 | 0 | to | 75 | 0 | 0 |
| Sulphate | .. | ton | 60 | 0 | 0 | to | 62 | 0 | 0 |
| Methyl acetone | .. | ton | 60 | 0 | 0 | to | 65 | 0 | 0 |
| Alcohol, 1% acetone | .. | ton | 65 | 10 | 0 | to | 66 | 0 | 0 |
| Nickel sulphate, single salt | .. | ton | 49 | 0 | 0 | to | 51 | 0 | 0 |
| Ammonium sulphate, double salt | .. | ton | 51 | 0 | 0 | to | 52 | 0 | 0 |
| Potash, Caustic | .. | ton | 33 | 0 | 0 | to | 34 | 0 | 0 |
| Potassium bichromate | .. | lb. | 0 | 0 | 6½ | to | — | — | — |
| Carbonate, 90% | .. | ton | 31 | 0 | 0 | to | 33 | 0 | 0 |
| Chloride, 80% | .. | ton | 12 | 0 | 0 | to | 12 | 10 | 0 |
| Chlorate | .. | lb. | 0 | 0 | 4½ | to | 0 | 0 | 5 |
| Meta bisulphite, 50-52% | .. | ton | 84 | 0 | 0 | to | 90 | 0 | 0 |
| Nitrate, refined | .. | ton | 45 | 0 | 0 | to | 47 | 0 | 0 |
| Permanganate | .. | lb. | 0 | 0 | 9 | to | 0 | 0 | 10 |
| Prussiate, red | .. | lb. | 0 | 4 | 6 | to | 0 | 4 | 9 |
| Prussiate, yellow | .. | lb. | 0 | 1 | 5 | to | 0 | 1 | 6 |
| Sulphate, 90% | .. | ton | 13 | 0 | 0 | to | 13 | 10 | 0 |
| Salammoniac, firsts | .. | cwt. | 3 | 3 | 0 | to | — | — | — |
| Seconds | .. | cwt. | 3 | 0 | 0 | to | — | — | — |
| Sodium acetate | .. | ton | 24 | 10 | 0 | to | 24 | 15 | 0 |
| Arsenate, 45% | .. | ton | 45 | 0 | 0 | to | 48 | 0 | 0 |
| Bicarbonate | .. | ton | 10 | 10 | 0 | to | 11 | 0 | 0 |
| Bichromate | .. | lb. | 0 | 0 | 5½ | to | — | — | — |
| Bisulphite, 60-62% | .. | ton | 23 | 0 | 0 | to | 24 | 0 | 0 |
| Chlorate | .. | lb. | 0 | 0 | 3½ | to | 0 | 0 | 4 |
| Caustic, 70% | .. | ton | 20 | 10 | 0 | to | 21 | 0 | 0 |
| Caustic, 76% | .. | ton | 21 | 10 | 0 | to | 22 | 10 | 0 |
| Hydrosulphite, powder, 85% | .. | lb. | 0 | 1 | 9 | to | 0 | 2 | 0 |
| Hyposulphite, commercial | .. | ton | 13 | 10 | 0 | to | 14 | 0 | 0 |
| Sodium Nitrite, 96-98% | .. | ton | 31 | 0 | 0 | to | 32 | 0 | 0 |
| Phosphate, crystal | .. | ton | 18 | 10 | 0 | to | 19 | 0 | 0 |
| Perborate | .. | lb. | 0 | 0 | 11 | to | 0 | 1 | 0 |
| Prussiate | .. | lb. | 0 | 0 | 11½ | to | 0 | 1 | 0 |
| Sulphide, crystals | .. | ton | 13 | 0 | 0 | to | 14 | 0 | 0 |
| Sulphide, solid, 60-62% | .. | ton | 21 | 10 | 0 | to | 23 | 10 | 0 |
| Sulphite, cryst. | .. | ton | 12 | 10 | 0 | to | 13 | 0 | 0 |
| Strontium carbonate | .. | ton | 55 | 0 | 0 | to | 60 | 0 | 0 |
| Strontium Nitrate | .. | ton | 50 | 0 | 0 | to | 55 | 0 | 0 |
| Strontium Sulphate, white | .. | ton | 6 | 10 | 0 | to | 7 | 10 | 0 |
| Sulphur chloride | .. | ton | 25 | 0 | 0 | to | 27 | 10 | 0 |
| Sulphur, Flowers | .. | ton | 13 | 0 | 0 | to | 14 | 0 | 0 |
| Roll | .. | ton | 13 | 0 | 0 | to | 14 | 0 | 0 |
| Tartar emetic | .. | lb. | 0 | 1 | 6 | to | 0 | 1 | 7 |
| Tin perchloride, 33% | .. | lb. | 0 | 1 | 2 | to | 0 | 1 | 4 |
| Perchloride, solid | .. | lb. | 0 | 1 | 5 | to | 0 | 1 | 7 |
| Protochloride (tin crystals) | .. | lb. | 0 | 1 | 5 | to | 0 | 1 | 6 |

| | | Per | £ | s. | d. | | £ | s. | d. |
|-----------------------------|----|-----|----|----|----|----|----|----|----|
| Zinc chloride 102° Tw. . . | .. | ton | 21 | 0 | 0 | to | 22 | 10 | 0 |
| Chloride, solid, 96-98% . . | .. | ton | 25 | 0 | 0 | to | 30 | 0 | 0 |
| Oxide, 99% | .. | ton | 36 | 0 | 0 | to | 38 | 0 | 0 |
| Dust, 90% | .. | ton | 45 | 0 | 0 | to | 47 | 10 | 0 |
| Sulphate | .. | ton | 18 | 10 | 0 | to | 19 | 10 | 0 |

Coal Tar Intermediates, &c.

| | Per | £ | s. | d. | £ | s. | d. | |
|------------------------------------|------|---|----|----|----|----|----|----|
| Alphanaphthol, crude | lb. | 0 | 2 | 3 | to | 0 | 2 | 6 |
| Alphanaphthol, refined | lb. | 0 | 3 | 0 | to | 0 | 3 | 3 |
| Alphanaphthylamine | lb. | 0 | 2 | 0 | to | 0 | 2 | 1 |
| Aniline oil, drums extra | lb. | 0 | 1 | 0 | to | 0 | 1 | 1 |
| Aniline salts | lb. | 0 | 1 | 1 | to | 0 | 1 | 2 |
| Anthracene, 40-50% | unit | 0 | 0 | 8½ | to | 0 | 0 | 9 |
| Benzaldehyde (free of chlorine) .. | lb. | 0 | 3 | 9 | to | 0 | 4 | 3 |
| Benidine, base | lb. | 0 | 5 | 9 | to | 0 | 6 | 0 |
| Benidine, sulphate | lb. | 0 | 5 | 9 | to | 0 | 6 | 0 |
| Benzoic acid | lb. | 0 | 1 | 7½ | to | 0 | 1 | 9 |
| Benzoate of soda | lb. | 0 | 1 | 6 | to | 0 | 1 | 7 |
| Benzyl chloride, technical | lb. | 0 | 2 | 0 | to | 0 | 2 | 3 |
| Betanaphthol benzoate | lb. | 0 | 4 | 9 | to | 0 | 5 | 0 |
| Betanaphthol | lb. | 0 | 1 | 4 | to | 0 | 1 | 4½ |
| Betanaphthylamine, technical .. | lb. | 0 | 6 | 0 | to | 0 | 7 | 0 |
| Croceine Acid, 100% basis .. | lb. | 0 | 3 | 6 | to | 0 | 3 | 9 |
| Dichlorobenzol | lb. | 0 | 0 | 9 | to | 0 | 0 | 10 |
| Diethylaniline | lb. | 0 | 2 | 9 | to | 0 | 3 | 0 |
| Dinitrobenzol | lb. | 0 | 1 | 3 | to | 0 | 1 | 4 |
| Dinitrochlorobenzol | lb. | 0 | 0 | 11 | to | 0 | 1 | 0 |
| Dinitronaphthalene | lb. | 0 | 1 | 4 | to | 0 | 1 | 5 |
| Dinitrotoluol | lb. | 0 | 1 | 5 | to | 0 | 1 | 6 |
| Dinitrophenol | lb. | 0 | 2 | 9 | to | 0 | 3 | 0 |
| Dimethylaniline | lb. | 0 | 2 | 3 | to | 0 | 2 | 6 |
| Diphenylamine | lb. | 0 | 4 | 3 | to | 0 | 4 | 6 |
| H-Acid | lb. | 0 | 6 | 6 | to | 0 | 7 | 0 |
| Metaphenylenediamine | lb. | 0 | 5 | 6 | to | 0 | 5 | 9 |
| Monochlorobenzol | lb. | 0 | 0 | 10 | to | 0 | 1 | 0 |
| Metanilic Acid | lb. | 0 | 6 | 0 | to | 0 | 6 | 6½ |
| Monosulphonic Acid (2.7) .. | lb. | 0 | 5 | 6 | to | 0 | 6 | 0 |
| Naphthionic acid, crude | lb. | 0 | 3 | 0 | to | 0 | 3 | 3 |
| Naphthionate of Soda | lb. | 0 | 3 | 0 | to | 0 | 3 | 3 |
| Naphthylamine-di-sulphonic-acid | lb. | 0 | 4 | 0 | to | 0 | 4 | 3 |
| Neville Winther Acid | lb. | 0 | 7 | 9 | to | 0 | 8 | 0 |
| Nitronaphthalene | lb. | 0 | 1 | 4 | to | 0 | 1 | 5 |
| Nitrotoluol | lb. | 0 | 1 | 0 | to | 0 | 1 | 2 |
| Orthoamidophenol, base. . . | lb. | 0 | 10 | 0 | to | 0 | 10 | 5 |
| Orthodichlorobenzol | lb. | 0 | 1 | 0 | to | 0 | 1 | 1 |
| Orthotoluidine | lb. | 0 | 1 | 6 | to | 0 | 1 | 9 |
| Orthonitrotoluol | lb. | 0 | 0 | 10 | to | 0 | 1 | 0 |
| Para-amidophenol, base | lb. | 0 | 10 | 0 | to | 0 | 10 | 6 |
| Para-amidophenol, hydrochlor .. | lb. | 0 | 10 | 6 | to | 0 | 11 | 0 |
| Paradichlorobenzol | lb. | 0 | 0 | 6 | to | 0 | 0 | 7 |
| Paranitraniline | lb. | 0 | 3 | 6 | to | 0 | 3 | 9 |
| Paranitrophenol | lb. | 0 | 2 | 3 | to | 0 | 2 | 6 |
| Paranitrotoluol | lb. | 0 | 5 | 0 | to | 0 | 5 | 3 |
| Paraphenylenediamine, distilled | lb. | 0 | 10 | 6 | to | 0 | 10 | 9 |
| Paratoluidine | lb. | 0 | 7 | 0 | to | 0 | 7 | 6 |
| Phthalic anhydride | lb. | 0 | 2 | 9 | to | 0 | 3 | 0 |
| Resorcin, technical | lb. | 0 | 5 | 6 | to | 0 | 6 | 0 |
| Resorcin, pure | lb. | 0 | 7 | 0 | to | 0 | 7 | 3 |
| Salol | lb. | 0 | 2 | 1 | to | 0 | 2 | 4 |
| Sulphanilic acid, crude | lb. | 0 | 1 | 0 | to | 0 | 1 | 1 |
| Tolidine, base | lb. | 0 | 6 | 6 | to | 0 | 7 | 0 |
| Tolidine, mixture | lb. | 0 | 2 | 6 | to | 0 | 2 | 9 |

Contracts Open

Tenders are invited for the following articles. The latest dates for receiving tenders are, when available, given in parentheses:

AMSTERDAM (July 5th).—Various paints, lithopone, turpentine, raw carbolic acid, gum arabic, graphite, nitric acid, ether, naphthalene, yellow ochre, white soap, &c. Particulars from Department of Overseas Trade (Room 84), 35, Old Queen Street, London. (Reference No. 16011/F.W./G.C./2).

Workman's Compensation Claim

In the Bow County Court on Wednesday, Judge Graham reserved judgment in an application by G. Gibbard, chemical labourer, against Thomas Tyrer and Co., Ltd., chemical manufacturers, of Stratford, for compensation for the loss of the sight of one eye.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.

GLASGOW, JUNE 28, 1922..

THE past week gave indications of an improvement in business, the number of orders booked being above the average for the last few months.

Inquiries are plentiful, and prices well maintained.

In coal tar products benzol is in larger supply, and prices are easier.

Industrial Chemicals

ACETONE.—Some inquiry for prompt delivery; price £65 to £70 per ton.
 ACID ACETIC.—Numerous inquiries, especially for glacial, quoted £64 to £65 per ton; 80% B.P. £44 per ton; technical, £41 per ton.
 ACID BORACIC.—Prices unchanged. Crystal or granulated, £60 per ton; powdered, £62.
 ACID HYDROCHLORIC.—In slightly better request. Price 6s. 6d. per carboy, ex works.
 ACID OXALIC.—Quoted 8½d. to 8¾d. per lb. Continental offers of 7½d. c.i.f., duty paid.
 ACID SULPHURIC.—Prices unchanged; 144°, £4 per ton; 168°, £7 5s. per ton; de-arsenicated, £1 per ton extra.
 ACID TARTARIC.—Quoted 1s. 5d. to 1s. 6d. per lb.
 ALUMINA CHROME, 15%.—A few export inquiries. Price £22 to £23 per ton, f.o.b., U.K.
 ALUMINA SULPHATE.—In little request. 17/18%, about £11 per ton; 14/15%, £9 per ton.
 ALUM. LUMP POTASH.—Spot lots available at £15 5s. ex store. Moderate demand.
 AMMONIA CARBONATE.—Remains 4d. to 4½d. per lb. Moderate inquiry.
 AMMONIA, LIQUID, 88°.—Quoted 3½d. per lb., ex works. Little inquiry.
 AMMONIA MURIATE.—Makers' price unchanged; £34 per ton, f.o.r.
 AMMONIA, SALAMMONIAC, CRYSTALS.—Price unchanged, about £58 per ton.
 AMMONIA SULPHATE.—25¼%, £15 10s. per ton; 25¾%, neutral quality, £16 13s. per ton, ex works, prompt delivery.
 ARSENIC, WHITE, POWDERED.—A few inquiries; price £44 per ton ex quay.
 BARIUM CHLORIDE.—English make about £21 per ton. Continental offers of £19 15s. per ton c.i.f. U.K.
 BARYTES.—In moderate request; fine white quality now £5 10s. ex works; grey, £3 10s. ex works.
 BLEACHING POWDER.—Spot lots, £14 per ton, ex station. Little inquiry.
 BORAX.—Price unchanged. Crystal or granulated, £29 per ton; powder, £1 per ton extra.
 CALCIUM CHLORIDE.—English make, £6 10s. per ton ex quay or station. Continental offers of £6 per ton c.i.f.
 COPPER SULPHATE.—In moderate request. £28 per ton ex quay.
 COPPERAS, GREEN.—£3 15s. to £4 per ton.
 DEXTRINE.—Offered at £18 10s. per ton, delivered.
 GLAUBER SALTS.—Spot lots of fine crystals, £5 per ton ex store.
 LEAD ACETATE.—Continental offers of white crystals at £36 10s. c.i.f. U.K.
 LEAD, RED.—£37 per ton; a few inquiries.
 LEAD, WHITE.—£50 10s. per ton; in little demand.
 MAGNESITE, GROUND CALCINED.—In little request. £10 to £12 10s. ex store, according to quality.
 MAGNESIUM CHLORIDE.—Fair inquiry. Spot lots, £7 12s. 6d. ex store. Offered for forward delivery at £6 10s. c.i.f.
 MAGNESIUM SULPHATE (Epsom Salts).—Commercial salts, £7 10s. per ton; B.P., £9 15s. delivered.
 POTASSIUM BICHROMATE.—Price unchanged; 6¾d. per lb. delivered.
 POTASSIUM CARBONATE, 90/92%.—On offer at £30 per ton ex store. Practically no demand.

POTASSIUM CAUSTIC, 88/90%.—Cheap Continental offers about £30 per ton c.i.f.; spot lots, £34 ex store.
 POTASSIUM CHLORATE, 99¼%.—Continental make for forward delivery, 4½d. per lb. c.i.f.
 POTASSIUM NITRATE (Saltpetre). In little request. Price unchanged, £35 per ton.
 POTASSIUM PRUSSATE.—Quoted 1s. 4½d. per lb.
 SODIUM BICARBONATE.—Refined quality £11 per ton, ex quay or station; m.w. quality £10 per ton.
 SODIUM BICHROMATE.—Price unchanged, 6¾d. per lb. delivered.
 SODIUM CARBONATE (Soda Crystals).—£6 per ton, ex quay or station.
 SODIUM CARBONATE (Alkali, 58%).—£9 12s. 6d. per ton, ex quay or station.
 SODIUM CAUSTIC.—Prices for spot delivery remain, 76/77%, £25 10s.; 70/72%, £23 10s.; 60%, £26 5s.; 98/99%, powdered, £29 to £30 per ton.
 SODIUM CHLORATE.—Continental offers of 2½d. per lb., c.i.f.
 SODIUM HYPOSULPHITE.—Commercial crystals, £14 10s. per ton; pea crystals, £20 10s. per ton, ex store.
 SODIUM NITRITE.—Ten ton lots offered at £30 per ton, on 100% basis, carriage paid.
 SODIUM SILICATE, 140°.—In little demand. Spot delivery, £10 to £11 per ton, ex station.
 SODIUM SULPHATE (Saltcake, 95%).—Price unchanged; £4 per ton, f.o.b. for export.
 SODIUM SULPHIDE, 60/62%.—Solid, £21; broken, £23 per ton, ex station. Continental offers of £17 10s., c.i.f. U.K.
 SULPHUR.—Government stocks of Sicilian thirds available at £4 5s. to £4 15s. per ton, according to quantity.
 ZINC CHLORIDE, 98/99%.—Continental make offered at £20 10s. per ton, c.i.f. U.K.
 ZINC DUST, 92/94%.—Offered at £40 per ton, c.i.f. U.K. port.
 NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

Coal Tar Intermediates and Wood Distillation Products

ANTHRANILIC ACID.—Home inquiry. Supplies offered at 10s. per lb. on 100% basis, delivered.
 BENZOL.—The market continues to weaken and good supplies are available.
 BENZYL CHLORIDE.—Home inquiry. Price 2s. 2d. per lb., delivered.
 DIPHENYLAMINE.—Price remains firm, at 4s. 3d. per lb., delivered.
 MONOCHLORANILINE.—Home inquiry. Price quoted, 9d. per lb., carriage paid, returnable packages.
 PARADICHLOROBENZOL.—Home and export inquiries. Price quoted, £40 per ton, carriage paid or f.o.b., packages included.
 PHTHALIC ANHYDRIDE.—Export inquiry. Price quoted, 2s. 6d. per lb., f.o.b.
 SALICYLIC ACID, B.P.—Small inquiries for the home trade. Price from 1s. 6d. to 1s. 7d. per lb., delivered.
 TOLIDINE BASE.—Some inquiry for export. Price 7s. per lb., 100% basis, f.o.b.

Labour and Chemical Research

DEALING in a letter to the Press, with the connexion between labour and chemical research, Mr. Joseph H. Dracon, managing director of Grays Dyes and Colours, Ltd., says this connexion is so direct and so exceedingly intimate that it is surprising to find the trade unions concerned so devoid of interest in the matter. He is of the opinion that Parliamentary support to general projects is scarcely sufficient when one considers what a powerful stimulant research is to labour, and he would like to see the trade unions take a financial interest in protecting and fostering this work. The cost of the work, he says, is extremely small in comparison with the advantages to the national well-being.

Safeguarding of Industries Act

Awards in Arbitrations under Part I

JUDGMENT has been given by the Referee in arbitrations relating to the following complaints under sect. 1, sub-section 5 of the Safeguarding of Industries Act. In accordance with the award, "Acid Boric" is removed from the lists of articles chargeable with duty under Part I. of the Act as from June 29.

Scientific Glassware

In his award on scientific glassware, the Referee states that the question whether the descriptions complained of are properly included in the list of dutiable articles depends upon the meaning of the words used. He is satisfied that all the descriptions complained of are properly included in the list provided that these descriptions are used strictly and within the limits which are defined in this award. Reagent bottles are properly in the list provided that by the expression "reagent bottle" is meant a bottle which is reasonably fit for containing chemical reagents. The legal obligation implied in the sale of such bottles is that the bottle shall be reasonably fit for containing any chemical reagent, except possibly some exceptional substance calling for special and exceptional qualities in its container. This obligation means that the bottle must be made of hard suitable glass free from lead, *i.e.*, containing no more than such a trace as does not matter. The neck and stopper must be ground so as to make a perfectly air tight joint. If a bottle does not fulfil these requirements it is not suitable for containing chemical reagents, and is not scientific glassware. Mr. Atkinson gathers that the distinctive shapes of reagent bottles have been copied and that the description has been applied to inferior bottles and that these practices have led to trouble with the Customs. That trouble, he states, is not for him to deal with. A hydrometer jar, he continues, means a jar suitable for hydrometer tests. It is of distinctive type, straight sided, of circular or elliptical section from six to ten inches high. The glass must be good and very clear. The jar must be a very good cylinder and must be capable of standing rapid changes of temperature.

Specimen Museum and Surgical Jars

It is very possible that there is a practical difficulty in the case of these jars because the customary shape and description have been borrowed for all sorts of purposes which are not scientific and do not require scientific glassware. Any jar which is suitable for containing any scientific specimen not calling for exceptional treatment is a museum or specimen jar. All three jars require the same qualities, *i.e.*, they must have clear fronts so that there is no distortion caused by the glass. The edges must be ground very flat and true so that the glass plate laid on them will give an air tight fit and prevent evaporation. The glass must be sufficiently well made to prevent contamination of the liquid, if any, containing the specimen.

Cylindrical and Conical Measures

The Referee is of the opinion that these measures are on the border line, and that the only articles of these descriptions which can properly be considered as scientific glassware are measures which are in fact graduated with scientific accuracy. It is the correct graduation which, according to the evidence, makes them scientific glassware. He awards that the descriptions complained of are properly included in the list if and when defined within the limits laid down. The complaint therefore fails.

Part II.—Bronze Powders

In view of the nature of the report of the Committee on Gold and Aluminium Bronze Powders, it is not proposed to make an Order applying Part II. of the Act to imported bronze powders.

Filter-Press Plates

WE are informed by the Association of British Chemical Manufacturers that they will welcome any criticisms or suggested modifications in the proposed standard 48 in. square filter-press plates and frames which have been prepared by a joint committee of the Association and the British Chemical Plant Manufacturers' Association. Drawings of these plates appeared in THE CHEMICAL AGE of June 24.

Contracts for Coal Tar Pitch

Breach Claims Succeed

IN the King's Bench Division on June 21 Mr. Justice Bray resumed the hearing, after a lapse of over five months, of an action brought by Rudge, Brown, and Co., of Broad Street, Birmingham, against Rylance and Sons, Naylor Street, Liverpool, relating to a contract of March and April, 1920, for the supply of pitch. The plaintiffs alleged breach of contract to deliver to them medium soft coal tar pitch. The contract was for 70,000 tons of the pitch at 110s. per ton, deliveries to be from March, 1920. The plaintiffs had arranged for a resale, but the defendants had supplied only 130 odd tons of a quality, it was said, inferior to sample, and in consequence there was a claim against the plaintiffs by the second buyers. The defendants denied liability and counterclaimed for the price of the goods sold. His Lordship held that the delivery made was not up to sample, and awarded the plaintiffs £263 with costs. The plaintiffs also contended that there had been a repudiation of the contract by the defendants by a refusal to deliver the balance of the quantity ordered. His Lordship said that in his opinion the plaintiffs had failed to prove that by the date of the writ the defendants had refused to make further deliveries so as to bring the contract to an end. That part of the action, therefore, failed with costs.

Before Mr. Justice Bray, in the King's Bench Division, on June 22, the Sun Fuel Co., Ltd., of Salisbury House, London, brought an action against Rudge, Brown, and Co., Broad Street, Birmingham, and Southwark Street, London, claiming damages for breach of a contract to sell and deliver to the plaintiffs' works at Swansea 60,000 tons of medium soft coal tar pitch. Counsel on both sides agreed that the question for the Judge was merely one of damages. After evidence had been given for the plaintiffs, it was announced that both parties had agreed on the question of damages, and the defendants agreed to judgment for the plaintiffs. His Lordship assented.

Fuerst Brothers & Co., Ltd.

WE are informed by Mr. Jules Fuerst, of 17, Philpot Lane, that he has purchased the goodwill and trade-marks of Fuerst Brothers, Ltd., from the liquidator, such liquidation having become necessary partly owing to the decease of his brother, with whom he has carried on the business since the year 1884. Having decided that the business shall be continued under his direction at the same address and on the same lines as during the past 38 years, he has accordingly caused to be incorporated a private company under the style of Fuerst Brothers and Co., Ltd., with a nominal capital of £20,000, in whom such goodwill, trade-marks, and business will be vested.

Alleged Faulty Bottles for a Chemical Company

IN the Shoreditch County Court, on June 23, before Judge Cluer, the Eclipse Glass Works, Ltd., Eclipse Works, Lea Bridge, Clapton, sued the Chemical and By Products, Ltd., Rickmansworth Road, Watford, to recover £2 15s. 10d. being the balance alleged to be due on an order for bottles. The defence as put in was that only £1 13s. 10d. was due, as a proportion of the bottles broke as they were faultily annealed, and a cheque for that amount had been tendered. Mr. Dickson appeared as counsel for the plaintiffs, and mentioning that the defendants were not present, he asked for judgment. Judgment was entered for the plaintiffs for £2 15s. 10d. and costs.

"The Duty and Service of Science"

WE understand that a verbatim report of the address on this subject given by Mr. F. W. Sanderson before the National Union of Scientific Workers just before his death will be published shortly. Copies may be obtained from Major A. G. Church, National Union of Scientific Workers, 25, Victoria Street, Westminster, London, S.W.1, by any of our readers who care to send a foolscap addressed envelope, stamped 1d. Application should be made soon, in order that sufficient copies may be printed to meet the demand.

Company Report**British Dyestuffs Corporation****Sir W. Alexander's Appeal for Unity at Annual Meeting**

THE Third Ordinary General Meeting of British Dyestuffs Corporation Limited was held in Manchester yesterday, Sir William Alexander, K.B.E., Chairman of the Board, presiding.

In opening his speech the Chairman referred to the resignation of Sir Henry Birchenough as Chairman and of Sir William Aykroyd as Director, and after comparing the balance-sheet with that of the previous year he proceeded: I will now ask you to turn to the year's results as shown on the first page in the Directors' Report. The balance of profit after providing £467,106 for depreciation and crediting the amounts estimated to be recoverable in respect of Excess Profits Duty amounts to £437,683, against which we have been compelled to write off by way of reduction in stock values a total of £1,444,343, leaving a net loss for the year of £1,006,660. From this figure there must be deducted the balance of profit carried forward from the previous year, namely, £203,304, leaving a deficit of £803,355 to be carried forward to the next period. You will observe that the revaluation of our stocks at the market prices current on October 31 last has involved a total writing-off of £1,444,343. Since that date there has been a further slight fall in values, for which provision will require to be made in the accounts of the current year. You will all be aware that stock depreciation of a substantial nature has been almost universal during the last two years, but in our case the position has been aggravated by the accumulation of stocks of raw materials, intermediate products, and finished colours to which reference was made in last year's report. During 1919 and 1920 there was an extraordinary demand for dyestuffs of every description, accompanied by a world shortage of many essential raw materials and intermediate products. In consequence of this position many raw materials were purchased without proper specification, and many colour stocks were accumulated irrespective of their suitability for normal trade conditions, and insufficiently standardised for the ordinary requirements of the market. In other words, quality of production was sacrificed in order to obtain quantity. Every effort has been made to work up or dispose of these stocks, but this has necessarily involved a heavy loss, altogether apart from the provision required to be made to meet the general fall in values.

Abnormal Trade Depression

Your attention has been drawn in the report to the trading difficulties which the Company has had to encounter during the year. The abnormal depression in trade which began in August 1920 continued throughout the period under review, and this, coupled with the large stock of foreign dyestuffs held in the country at the date of the passing of the Dyestuffs (Import Regulation) Act, has resulted in the Company only being able to utilise less than one-fifth of the productive capacity of its works. The overseas markets, with which a profitable trade had been built up during the war, have been practically closed to us, owing to the supply of German dyestuffs at prices against which we are not able at the moment to offer effective competition, largely on account of depreciated exchange. We are, however, preserving a position in these markets with a view to developing their possibilities at some future time, when Germany will cease to have the bounty which the substantial difference between the internal and external values of the mark now confers upon her.

After taking into consideration a substantial amount recoverable by way of refund of Excess Profits Duty and the extraordinary provision required for stock depreciation, your Directors do not consider that the results disclosed are other than those which might be anticipated under the unfortunate circumstances which have handicapped the Company's operations and the adverse conditions of trade which have prevailed during the period. I propose to refer later to the economies which have been effected during the year in our organisation. The full benefit from our action in this direction will only be felt in the current year, but I would point out that our main hope of obtaining a reasonable return on the capital invested must lie in our ability to keep our plants well employed. Only a revival in trade can accomplish this, and until it occurs I must warn you that no trading profits can be anticipated.

I will now deal with the steps which have been taken by your Directors to reorganise the management of the Company in order to obtain co-ordination of effort, which is the first step towards success, and to effect essential reductions in the expenditure and commitments previously entered into. You are aware that the agreements of Dr. Herbert Levinstein and Sir Joseph Turner as Managing Directors were terminated in February 1921, since when they have had no part in the executive work of the Company. Also that in their place an Executive Committee, consisting of Sir Henry Birchenough, Mr. G. Vernon Clay, and myself, was appointed to take over the management of the undertaking and to investigate every aspect of the Company's activities. This temporary arrangement continued until August last, when, in accordance with the pledge given by your Chairman at the last Ordinary General Meeting, a system of single control was established by the appointment of myself as Chairman and Managing Director, with Mr. G. V. Clay responsible for the management of the works and technical staff, in which capacity he rendered real service to the Company. On the appointment of Dr. Burnham as General Works Manager (to which I shall refer immediately) Mr. Clay resigned from active control, and I should perhaps say that he did so against the wishes of his colleagues on the Board. I fear that in all important undertakings some differences of opinion are likely to arise, but I am glad to say that Mr. Clay will retain his seat on the Board and continue to give your undertaking the benefit of his wide knowledge and experience.

Works Administration

In order to co-ordinate our works administration, and to secure at each of our works the highest possible efficiency that can be obtained, Dr. J. C. Burnham has been appointed General Works Manager. Dr. Burnham comes to us with great administrative experience, having previously held responsible positions, and in particular that of General Works Manager at H.M. Munitions Factory at Gretna from its inception until its close. The administrative experience of Dr. Burnham, combined with the practical knowledge of dye-making possessed by the staff, will, I feel confident, lead in a short time to a marked improvement in manufacture and economy in production. The Technical and Research Departments of the Company continue as hitherto under the supervision of Professor A. G. Green, F.R.S., and Mr. J. Baddiley, M.Sc.

The Directors are satisfied that there is within the Corporation an adequate amount of scientific skill and experience which only requires proper directing and harmonious working towards a common end to secure satisfactory results. As a step in this direction, weekly meetings of the Heads of our Technical and Selling Staffs have been inaugurated. At these meetings all matters relating to production, distribution, and the co-ordination of research with works operations are fully discussed, and it is our policy that these meetings shall form the basis of an internal organisation under the supervision of the Managing Director which will ultimately cover all fields of the Company's trading activities.

Savings Effected

Reference is made in the Directors' Report to the heavy commitments previously entered into for extensions to the Company's plants and for supplies of raw materials. In February 1920 a Finance Sub-Committee of the Board was appointed to consider the heavy commitments then outstanding for capital expenditure with a view to their curtailment. These commitments were largely a legacy from the separate Companies before the merger, which, although nominally taking effect from November 1, 1918, did not really become effective until June 1919. At that date the Managing Directors reported that they had considered these commitments and recommended their approval to the Board. In October 1920 this Finance Committee, in conjunction with the then Managing Directors, was requested to examine all stocks and contracts outstanding for raw materials, with a view, where possible, to their realisation or cancellation. Consideration of these commitments both on capital and trading account,

involved an investigation in great detail, but in January 1921 the Chairman was able to report to the Board that substantial reductions in all directions had been effected. The Executive Committee, appointed in February 1921 to carry on the undertaking on the retirement of the Managing Directors, continued the revision of these commitments, and there are now no liabilities under these heads other than a balance of approximately £35,000 outstanding as regards capital expenditure, and no outstanding balances for the supply of raw materials other than those actually required for the current conduct of the business. It is satisfactory to be able to state that the total compensation paid to secure cancellations amounting approximately to £800,000 has been less than £30,000. The settlement of these commitments and the gradual reduction of stocks has now placed the Company's cash position on a firm basis and, combined with the amounts recoverable for refund of Excess Profits Duty, has enabled us to come before you to-day with a total balance of more than £1,250,000 in hand or invested in easily realisable securities. Every opportunity is still being taken to reduce the quantity of stocks on hand to a basis more commensurate with the normal requirements of trade.

Attention has also been given to the curtailment of standing expenditure, and economies aggregating approximately £200,000 per annum have been effected. I might here mention that your Directors have decided for the time being to forego 25 per cent. of the remuneration to which they are entitled under the Articles of Association.

War-Time Optimism

The general conditions in industry, both during the War and in the period immediately following the signing of the Armistice, were not conducive to economy, and sound methods of administration and control were often sacrificed in the endeavour rapidly to attain results which under normal circumstances would be recognised as requiring long and careful preparation. The industry of the country was passing through a period of feverish activity, and war psychology had affected even old-established undertakings. Your Company has suffered from those evils in a very marked degree; the industry to be established was new; the urgency to establish it was great; both of the constituent Companies had before the amalgamation committed themselves to large schemes of capital expenditure in the endeavour to meet the requirements of the colour user, and schemes of development were inaugurated before it was possible to give mature consideration to consequences. I fear that at that time the views expressed were too optimistic, and that it was beyond the capacity of the country speedily to do what other countries had taken many years to accomplish. The defects due to these abnormal conditions have now been remedied, and, as I have already stated, an effective system of management and administration has been established, but I should not wish you to think that we have already reached the high standard at which we aim; the progress has been substantial, but much remains to be done.

Let me now say just a word about our Research and Technical Departments, to which your Directors attach so much importance. We are fully alive to the necessity of continuous research for the development of the industry, but we are satisfied that the time has now come when this expenditure can be considerably curtailed without loss of efficiency, and steps have already been taken in this direction. At the same time the amount which the Company continues to set aside for this purpose is very substantial.

The Former Managing Director

In view of the criticisms which have recently been expressed your Directors are reluctantly compelled to refer to the decision under which the agreements with Sir Joseph Turner and Dr. Levinstein as Managing Directors to the Company were terminated in February 1921. Your Directors are still of opinion that they acted in the best interests of the Company. Unfortunately the personal antagonism between the two Managing Directors rendered it impossible to secure that co-operation and *esprit de corps* which are so highly essential to the welfare of your undertaking. Dr. Herbert Levinstein has recently resigned his seat on the Board, having previously been informed that his re-election would not be supported by his colleagues. He alleges as a ground for his resignation that he is unable to approve of the policy adopted by your Directors,

and I wish to correct any impression that may be gathered by colour users, shareholders, and others interested in the welfare of the undertaking from Dr. Levinstein's communications to the Press that the severance of his connexion with the Company, either in an administrative capacity or as a Director, will mean that the Company is left without proper scientific and technical control. There is no possible justification for such a statement. Your Directors are fully satisfied that the reorganisation of the staff, to which much time and thought has been given, has secured for the Company a thoroughly competent and loyal *personnel*, well qualified to carry on the complicated processes of dye-making.

Unfortunately, I must also make some reference to the re-election of Sir Joseph Turner. Speaking from the intimate knowledge which I have gained of the Company's organisation during the last few months, I am bound to say that the re-appointment of Sir Joseph Turner would, in my opinion, tend to reopen among the staff some of the old sores which are well on the way towards being healed. The Directors do not recommend the re-election of Sir Joseph Turner. I regret having to make this announcement, and I trust that Sir Joseph Turner will recognise that I am not actuated by any personal motives. The past history of your undertaking requires that I should take this course, much as I wish that it might be otherwise. This is, of course, a matter for the shareholders to decide, but I should add that your Board is unanimous on this point.

I should like here to refer very frankly to my own position as Chairman and Managing Director. I do not claim to be an expert in dye-making, but I claim to have some knowledge of the chemical manufacturing industry, and of the general principles on which any successful business organisation must be run. It is in the application of these principles to the development of the dye-making industry that I think I can best serve your Company. In accepting office I was well aware of the difficulties which would have to be overcome. I was also not unmindful of the criticism to which I should be subjected. I do not shirk any criticism in so far as it is honestly and intelligently directed towards the improvement of the Company's position, but I do ask you to allow us to go forward with our work with a feeling that we have not only a united Board and a loyal staff, but behind this the confidence and support of a substantial majority of our shareholders.

Charges for Dyestuffs

I now pass to criticisms of another character. Some of these criticisms are based upon inadequate and incorrect knowledge of the facts, and others are unfortunately prejudiced through political bias. In dealing with the prices charged for our colours some critics have been rather apt to take, as the basis of their criticisms, certain selected colours which for various reasons are sold to-day at much higher prices than prevailed before the war. But I would point out that the present average price of our colours is 3s. 5d. per pound, although in some instances colours are sold as high as 10s., 12s., and even 15s. per pound. Our prices have substantially fallen since 1920, and we shall keep them as low as is consistent with the safety of your undertaking. We are not asking the consumer to pay prices for our products based on the present abnormal costs of production, but have assumed an output three times larger than our present sales for costing purposes. Comparison is often made between the pre-war German prices and the prices now charged by British manufacturers. This basis of comparison may be fair when applied to old-established industries, but even here I should point out that the cost of many of our more essential raw materials, together with the cost of labour in our industry, shows a higher percentage increase over pre-war figures than is shown in most other industries. But apart from this the present conditions affecting the manufacture of dyestuffs in this country are so different from the conditions in Germany prevailing before the war as to render comparison of this nature subject to many important qualifications.

Another basis of comparison has been to compare prices at present quoted from Germany with the British price, and here my only comment is, considering the difference between the internal and external values of the mark, that the prices quoted by the German firms to this country are not considerably lower. These sterling prices, when converted into marks, are considerably higher than the home prices in

Germany, and may perhaps give colour-users an indication of the policy the German firms would adopt if we again surrendered the independence which the war taught us was essential to our national security.

The Question of Quality

I now pass to the question of quality. Earlier in my speech I referred to the effect on our trading results of the excessive stocks of dyestuffs accumulated during 1919 and 1920. Apart altogether from the loss caused by the writing down of these stocks to current values, the policy of concentrating on quantity at the expense of quality was, in my opinion, a mistaken one. In the development of our business it is essential, if we are to preserve the goodwill of the user and safeguard the interests of our shareholders, that we should go slowly and concentrate our efforts on improving the standard of the products we have already placed on the market, introducing new colours as and when we have reached a standard that we can confidently recommend to our customers. I think that our users will agree that during the last twelve months a general improvement has been shown in the quality of our production, whilst a number of new colours of satisfactory quality have already been placed on the market, and others will follow shortly.

Let me refer briefly to another matter. It has been said in various places that our colours are sold at lower prices in foreign markets than those charged to users in this country. This is not correct. With the exception of small quantities of colour which have deteriorated and must be sold at job prices because they are below standard, all colours in foreign markets are sold at prices which are consistent with those charged in this country.

The Dyestuffs Act

I now pass to the agitation which, as you are well aware, has grown up recently for the repeal of the Dyestuffs (Import Regulation) Act. The agitation has received support from various interests, and it is, of course, the privilege of any British subject to work for the repeal of an Act of Parliament which he considers obnoxious or detrimental to his trade. I would remind you, however, that this Act was passed with the support of a majority of the colour users in this country, and in fulfilment of the pledge given by H.M. Government to afford security for a term of years to the dyestuffs industry. On the strength of this pledge shareholders were invited to invest their money in the Company. Let me again point out that the dye users have a majority to represent their interests upon the Licensing Committee which has been set up under the Act, and this, I venture to think, should be an adequate safeguard. Nevertheless, the policy of this Corporation will be to assist the user by every means in its power consistent with the security of the industry.

Efficiency in every direction is of paramount importance if the dye-making industry is to be established in this country. Much more than this, however, is necessary. There must be recognised on all sides that special facilities are required for this purpose, and that some form of security against the temporary ability of Germany to sell at very low prices must be maintained. If the colour users of the country are not prepared to recognise this position and to support us to the utmost of their power, I cannot see how this Company, for the formation of which they are largely responsible, can succeed, or that the directors would be justified in advising the shareholders, at the risk of their capital, to continue their efforts for the establishment of a national dye-making industry.

Important Negotiations

The position at the moment is one of great delicacy, and requires more than ever complete confidence in the judgment and ability of your Board. Negotiations are in progress both with the Government and with the colour users, which may have an important bearing on the future of the industry. Informal discussions have taken place between the representatives of the German dye-making industry and those of your Company. The object of these discussions has been to discover, if possible, a plan which will secure a satisfactory working arrangement between the dye-makers in Germany and those in this country. Whilst we would welcome an arrangement with the German undertakings, it must be on such terms as will leave inviolate the principle upon which your undertaking was founded, namely, the establishment of a dye-making industry in this country adequate to our needs

both in peace and in war. So far, however, the German interests are not of the opinion that circumstances are such that they are prepared to accept this fundamental principle which we have laid down as a basis for close negotiation.

A Chapter of History

I cannot, I fear, conclude my speech without reference to a circular which has been sent to you by four user members. That circular, as I understand it, indicates that the present management of your Company is uninformed and inefficient, and suggests that its only salvation is the appointment of a competent managing director with technical knowledge and commercial fitness. I do not know who may be suggested, but, on the assumption that it may be one, or both, of the gentlemen who previously held the position, I feel I must place certain facts before you. I am adopting this course with very great reluctance, and my statements are not made primarily for the purpose of vindicating the action taken by your Board, and which was approved in principle at the last Ordinary General Meeting, although, in fact, they are a vindication. Still less do I wish to add to those controversies about persons which have played all too sad a part in hindering the development of this great national undertaking. I am about to make these statements as a warning, and in order that you may have before you all the important facts which appear to be relevant.

From the formation of your Company in 1918 until the end of 1920 those who have occupied seats on this Board placed implicit faith in the two men who acted as managing directors, and who were regarded as the outstanding personalities in the British dyestuffs industry. Dr. Levinstein had absolute control of the technical departments and Sir Joseph Turner of the commercial departments. Their recommendations as managing directors were not challenged, and they had a free hand during a period of great demand—a period free from the many difficulties we are now encountering. Yet there is irrefutable evidence of gross blunders committed during that period which no business man could forgive, and which, I suggest, must be taken into the fullest consideration if the suggestion I have assumed is made to you.

Dyestuffs were produced greatly in excess of trade requirements; insufficient attention was paid to efficiency and quality; overhead charges, salaries and wages were far in excess of the amounts justified by the turnover; no efficient check was exercised on indiscriminate expenditure at the works for repairs and alterations; raw materials and intermediate products to the value of hundreds of thousands of pounds, many of them subject to rapid deterioration, were purchased and stored under unsuitable conditions; in many cases the quantities purchased represented a consumption equal to two, three, or more years on the basis of the maximum production realised by the Corporation. The prices at which these goods were purchased can well be imagined, and are reflected in the accounts before you.

The Situation To-Day

In fairness to my colleagues and myself I must go farther, and again direct your attention to the situation to-day. You have no commitments except those necessary for current production; you have co-ordination of production and demand; you have improved quality from every point of view; expenses have been curtailed; your works are better managed and more cheaply and efficiently directed than ever before; you are steadily adding new colours of good quality to your list, and you have cash assets which exceed £1,000,000. As I stated before, I have spoken to you in this manner with great reluctance, but I think it is only right you should have these facts before you.

I must now, I think, refer to the speech which Dr. Levinstein has delivered to a number of Members of Parliament. The burden of his complaint appears to be that your Corporation has been under the control and influence of the Government. That is clearly a matter of public interest, and Dr. Levinstein is entitled to confer with Members of Parliament, with a view, it may be, of eliciting explanations from the Government. As I have received a request to address the members of the Commercial Committee of the House of Commons in reply to Dr. Levinstein, I must ask you to allow me to reserve my evidence in refutation of Dr. Levinstein's statements for that occasion. I am led to speak to you in this manner by the very sincere hope that this meeting will mark the end of a far-

too-long period of personal controversy, and that you will give us your confidence to go forward in a new atmosphere with our task of establishing the British dyestuffs industry, which is demanded by national safety and by national pride.

The Chairman concluded by moving the adoption of the report and accounts.

This was seconded by Mr. G. P. Norton.

Discussion

Sir Joseph Turner, in a speech devoted chiefly to a defence of his former work in the management of the Corporation, complained that the chairman had been holding meetings with some of the largest shareholders, and giving them information regarding the working of the undertaking which was detrimental to his (Sir Joseph's) position, and that this ought not to have been done without affording him an opportunity of defending himself. He also asserted that the balance sheet was misleading, in so far as it did not disclose trading losses, and that in the works of the Company there were hundreds of thousands of pounds worth of plant and machinery for the manufacture of dyes wanted by this and other countries, which had never turned a wheel.

Mr. T. Parker-Smith moved an amendment referring back the report and accounts, and demanding a searching inquiry into the affairs of the Corporation by a committee of shareholders to include Sir Charles Sykes, M.P., Sir Emmanuel Hoyle, Mr. Riley, Mr. C. R. Daniels and Mr. A. E. Hawley. There was a strong feeling among the shareholders, he said, that the Company was not in proper hands. There was no one on the board, excepting Sir Joseph Turner, who had ever been in a dyestuffs manufactory before he joined this board, and the prices of the dyestuffs produced were too high.

Sir Charles Sykes said he could not possibly sit on such a Committee, and appealed to the shareholders to endeavour to come to some compromise, and set this great industry on a basis which would enable it to compete with the rest of the world.

After a consultation with Mr. Cowan—the Corporation's solicitor—the Chairman ruled that the amendment was not in order. For similar reasons he also ruled out of order a further amendment asking for the appointment of a Committee of Inquiry by the House of Commons.

Sir Emmanuel Hoyle agreed that colour users were not getting satisfaction from the Corporation, and lamented the existence of an "undercurrent of dissent and controversy" and the fact that they had not a united Board. If the Board would pull together he thought they should be able to make dyestuffs against the Germans or any other manufacturers, and he appealed to the Board to accept any help that could be given to them by the Colour Users' Association or any similar body.

Alderman Harford (Liverpool), as a shareholder who invested money in the concern simply from the point of view of national necessity, urged that there was justification for the demand for a Committee of Inquiry in order to bring back the confidence of the shareholders in the Company.

Mr. H. Sutcliffe Smith, chairman of the Colour Users' Association, said he was voicing the views of the Bradford Dyers' Association when he said the colour users were absolutely determined that this industry should be established in this country. We needed it for our trade security. (Hear, hear.) He suggested three points for the consideration of the Board—that the Government should wipe out their loan to the Company, that the Company would have to face a scheme of reconstruction, and that the Board would eventually see its way to have this great Corporation managed by men bred and brought up in the business. He strongly appealed to the shareholders to give Sir William Alexander and his Board "a fighting chance," especially in view of the slump through which they had to struggle.

Mr. Forrest Hewit (Calico Printers' Association), like Mr. Sutcliffe Smith, opposed the appointment of a Committee of Inquiry, and asked for the co-operation of all concerned in putting the Corporation on a sound dividend-earning basis. In such an undertaking there was bound to be a large number of technical people and specialists, but there must be one directing brain in charge of the whole thing. Personally he had every confidence in Sir William Alexander.

Mr. C. R. Hindley intimated that the resolution moved by the Chairman had the support of the British Cotton and Wool Dyers' Association.

On being put to the vote the resolution was announced by the Chairman to have been carried by a large majority.

Mr. Parker-Smith demanded a poll, which was taken, with the following result:—

For the adoption of the report.....2,320,637

Against1,086,023

The Chairman added that in these figures no account was taken of the Government's holding of 1,700,000 votes. (Cheers.)

By a majority the meeting accepted a resolution not to fill up the vacancy on the Board of Directors caused by the retirement of Sir Joseph Turner.

On the motion of Dr. Levinstein, the retiring auditors, Messrs. Thomson, M'Lintock and Co., were reappointed, and the meeting closed with a vote of thanks to the chairman, which was moved by Mr. F. Eastman, of Pullar's Dyeworks, Ltd.

Company News

B. LAPORTE, LTD.—The directors announce a dividend on the 6 per cent. and the 7½ per cent. preference shares.

AMERICAN CYANAMID Co.—A dividend of 3 per cent. on the preferred stock is payable on July 7 to holders of record June 27.

BRITISH CYANIDES Co., LTD.—The accounts for the year to April 30 last will now be completed forthwith and the annual general meeting will be held at an early date.

ASBESTOS CORPORATION OF CANADA.—Dividends have been declared of \$1¼ per share on the preferred stock and \$1¼ per share on the common stock, both for the quarter to June 30, payable on July 15.

DISTILLERS Co.—The directors have declared a further dividend of 12s. per share on the ordinary shares, making 10 per cent., free of tax, for the year to May 15, payable on August 1; £108,994 is carried forward.

WILKIE AND SOAMES, LTD.—It is reported that the 6 per cent. preference shareholders have received an offer from Lever Brothers, Ltd., of fifteen 8 per cent. cumulative "A" preference £1 shares in exchange for every two £10 shares of their present holdings.

BRITISH SOUTH AFRICAN EXPLOSIVES Co.—The directors announce a dividend for the year 1921 at the rate of 10 per cent. less British income tax at the rate of 4s. 7d. in the £, less also 1s. in the £ in respect of South African dividend tax. Holders of stock warrants may collect the above dividend at the offices of the Union Bank of Scotland, Ltd., 62, Cornhill, London.

SOCIETY FOR CHEMICAL INDUSTRIES IN BASLE.—For the year ended December 31 last, the accounts show a net profit of 1,471,890 fr., as compared with 3,190,503 fr. in the preceding year. The trading profit, including the return from the various subsidiary companies amounted to 6,782,360 fr. showing thus only a small reduction on the corresponding figure for 1920, which was 6,982,112 fr. This is due to the fact that the cost of manufacturing had been considerably reduced during the year, as explained in the report.

LAUTARO NITRATE Co.—According to the accounts for 1921, the balance that was brought in was £71,922; it was now proposed to transfer the balances of reserve accounts to profit and loss account, viz., general reserve £175,000 and special reserve £35,202, making £282,124. Deducting the net loss after the transfer of the balance of depreciation account £209,569, leaving £72,555, which the directors propose to carry forward. The result of the year's working is based on about 5,000 tons over and above the 40,000 tons of nitrate the company had in the Nitrate Pool, which was transferred to the syndicate in accordance with the agreement of April 29, 1921, against their surrender of 40,000 shares, representing £200,000 share capital. Owing to the general depression in the nitrate trade, oficinas Lautaro and Ballena have been closed since January, 1921, and oficina Santa Luisa has been working at about half its productive capacity. The company's quota of shipments is, however, based on sales made by Association of Producers, and as these have been very small, the company's shipments for the present year so far had only reached 6,000 tons, but an improvement in demand from now to the end of the year leads the board to expect an increased quota in the last six months of this year. The annual meeting will be held at River Plate House, Finsbury Circus, London, on July 3, at noon.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible or any errors that may occur.

County Court Judgments

[NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.]

HAIGH, H. S., 19, Holton Road, Barry Dock, chemist. £10 18s. 11d. April 20.

JAMES, H. Palmer, Tudor Square, Tenby, chemist. £14 1s. 10d. April 13.

LLEWELLYN, Willie, Dunraven Street, Tonypandy, chemist. £10 11s. 6d. April 21.

MANSELL Albert Irwin, 35, Hampstead Road, N.W., chemist. £18 12s. 6d. May 2.

PYE, Harry, 18, Bridge Street, Spalding, chemist. £16 1s. 9d. April 28.

SWAN, William and Co., Branhholme Works, Bailiff Bridge, manufacturing chemists. £23 6s. May 1.

Receivership

PARR'S DYE AND CHEMICAL CO., LTD.—J. Darrah, 259, Manchester Road, Heaton Chapel, was appointed receiver and manager on May 25, under powers contained in debenture dated February 10, 1922.

Mortgages and Charges

[NOTE.—The Companies Consolidation Act, of 1908, provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.]

KILNER (JOHN) AND SONS, LTD., Wakefield, glass manufacturers.—Registered June 16, mortgage, to bank, charged on Calder Vale Glass Bottle Works, Wakefield, with power, trade machinery, etc. *£700. December 31, 1921.

LEIGHTON LABORATORIES, LTD., London, E.C., manufacturers of chemicals.—Registered June 15. £5,000 debentures, present issue £1,650; general charge.

QUEENBOROUGH GLASS BOTTLE WORKS, LTD., London, W.C.—Registered June 14, £29,906 5s. 10d. and £96,614 3s. 3d. debentures, to British and Foreign Bottle Co., Ltd., and British Glass Industries, Ltd., 41/43, Norfolk Street, W.C., respectively. *£4,000. March 14, 1922.

SOMERVILLE (W. A.), LTD., Liscard, chemists.—Registered June 13. £200 debentures; general charge. *£360. August 27, 1919.

Satisfactions

HEADLAND AND CO. (1912), LTD., Brighton, chemists.—Satisfaction registered June 20, £1,250, registered July 29, 1912.

RADIUM AND CHEMICAL CO., LTD., London, E.C.—Satisfaction registered June 9, £1,500; registered March 19, 1921.

London Gazette

Company Winding Up

THE INESON GIBBS OIL AND CHEMICAL CO., LTD. Registered office, Marshall Works, Milner Road, Selly Park, Birmingham. Winding-up order, June 15.

Companies Winding up Voluntarily

ALLIED BY-PRODUCTS AND CHEMICAL INDUSTRIES, LTD.—H. W. Brown, 17, Throgmorton Avenue, London, appointed liquidator.

ASSOCIATED TAR DISTILLERS, LTD.—H. W. Brown, 17, Throgmorton Avenue, London, appointed liquidator.

Bankruptcy Information

MASON, Daniel William, Mason's Cash Drug Stores, 175, Parc Road, Cwmparc, Glamorgan, drug store proprietor. First meeting, July 7, 3.45 p.m., 34, Park Place, Cardiff. Public examination, July 18, 10.15 a.m., Court House, Court House Street, Pontypridd.

Liquidator's Notice

BY-PRODUCT RECOVERIES, LTD. (in liquidation).—Particulars of claims to H. F. Wareham, 5, Wine Office Court, Fleet Street, London, the liquidator, by July 31.

Notices of Intended Dividends

LEWIS, Thomas Henry, and ASHCROFT, Frank, co-partnership under the style of LEWIS AND CO, 176, Moss Lane East, Manchester, and 5, Chapman Street, Hulme, Manchester, manufacturing chemists. Last day for receiving proofs, July 8. J. G. Gibson, Trustee, Byrom Street, Manchester.

VINE, Joseph, 222 and 224, Harrow Road, London, trading as THE TOILET SUPPLY CO., manufacturers of toilet preparations. Last day for receiving proofs, July 7. H. W. Buckingham, trustee, 24-27, Rood Lane, London, E.C.3.

Notice of Dividend

THOMPSON, John, lately carrying on business as THE THOMPSON CHEMICAL CO., 105, George Street, Manchester, chemical manufacturer. Amount per £, 5d. First and final. Payable, July 5, Official Receiver's offices, Byrom Street, Manchester.

Edinburgh Gazette

OZOBRITE CO. (THE), chemical manufacturers, 43, Wellington Street, Greenock (Thomas Robertson and Mrs. Sarah Robertson, trading as). A petition for sequestration has been presented by a creditor.

New Companies Registered

HOME SUPPLIES, LTD., Camber Mills, Town Quay, Portsmouth. Manufacturers of and dealers in soda-disinfectants, &c. Nominal capital, £1,000 in £1 shares.

FUERST BROTHERS AND CO., LTD. Manufacturers importers, exporters, shippers, and brokers of, and dealers in chemicals, oils, drugs, metals, chemical plant, photographic goods, &c. Nominal capital, £20,000 in £1 shares. A subscriber: W. A. Nash, 20, Beaconsfield Road, St. Margarets-on-Thames.

LIBERTY OILS, LTD., 1 Cullum Street, London. Manufacturers of oils, greases, essential oils, fat, tallow, &c., oil refiners, bone boilers, &c. Nominal capital, £1,050 in 1,000 "A" shares of £1 each and 1,000 "B" shares of 1s. each.

BRITEX CHEMICAL PRODUCTS, LTD., 26, Audrey Street, Ely Place, London. Manufacturers of and dealers in disinfectants, cosmetic preparations, etc. Nominal capital £14,000 in £1 shares (11,000 preference, and 3,000 ordinary).

"SOLOMIA" (1922), LTD., 31 and 32, Broad Street Avenue, London. Manufacturers of and dealers in insecticides and fungicides, etc. Nominal capital, £8,000 in £1 shares.

RÉCAMIER PRODUCTS, LTD., 21 St. James's Street, London. Manufacturers of and dealers in soaps, toilet requisites, etc. Nominal capital, £2,000 in £1 shares.

REGENERATIVE COAL GASIFICATION SYSTEM, LTD., Royal London Buildings, 196, Deansgate, Manchester. To take over certain patent rights from Dr. M. W. Travers and T. W. Clark, etc. Nominal capital, £300 in £1 shares (10 ordinary and 290 preference).

COTTON AND GENERAL INDUSTRIES, LTD., 30, Brown Street, Manchester. Chemical manufacturers, etc. Nominal capital, £5,000 in £1 shares.

AYLOTT AND CO., LTD. Manufacturers of and dealers in toilet preparations, including pomades, tonics and dressings for the hair, etc. Nominal capital, £1,000 in £1 shares. A director: S. C. Aylott, Downs Road, Luton.

BAINES' DIELECTRICS, LTD. Chemical manufacturers, etc. Nominal capital, £100 in 1s. shares. A subscriber: J. H. Smythe, 2 and 4, Tudor Street, London.

DRIERS, GUMS, OILS, METALLIC SALTS

and other products for the



PAINT, VARNISH, PRINTING, LINOLEUM, RUBBER,
LEATHER and OIL CLOTHS and allied INDUSTRIES.



SCOTTISH OFFICE:
140 West George St., GLASGOW.

Fredk. Boehm Ltd

AMERICAN OFFICE:
53 Park Place, NEW YORK.

Head Office:

15, 16 and 17, JEWRY STREET, LONDON, E.C.3, ENGLAND.

Factory: PIONEER CHEMICAL WORKS, STRATFORD, ESSEX.

ROLL SULPHUR

AND



JOHN NICHOLSON & SONS, Ltd.

PHONE: 20167, 20168

GRAMS: NICHOLSON, LEEDS

Hunslet Chemical Works **LEEDS**



Get the most from your Oil

through the use of

VALOR Oil Cabinets and VALOR Oil Filters

For Oil Storage.

Keep your oil clean and pure, free from dust and grit, in Valor Oil Cabinets.

Really the only perfect system for Oil Storage.

Stock sizes 50 and 30 gallons.

For Oil Filtration.

Economise in oil by using Valor Oil Filters.

Dirty waste oil can be recovered and used over and over again.

Made in two types of various capacities.

Prices and detailed descriptions
free upon application.

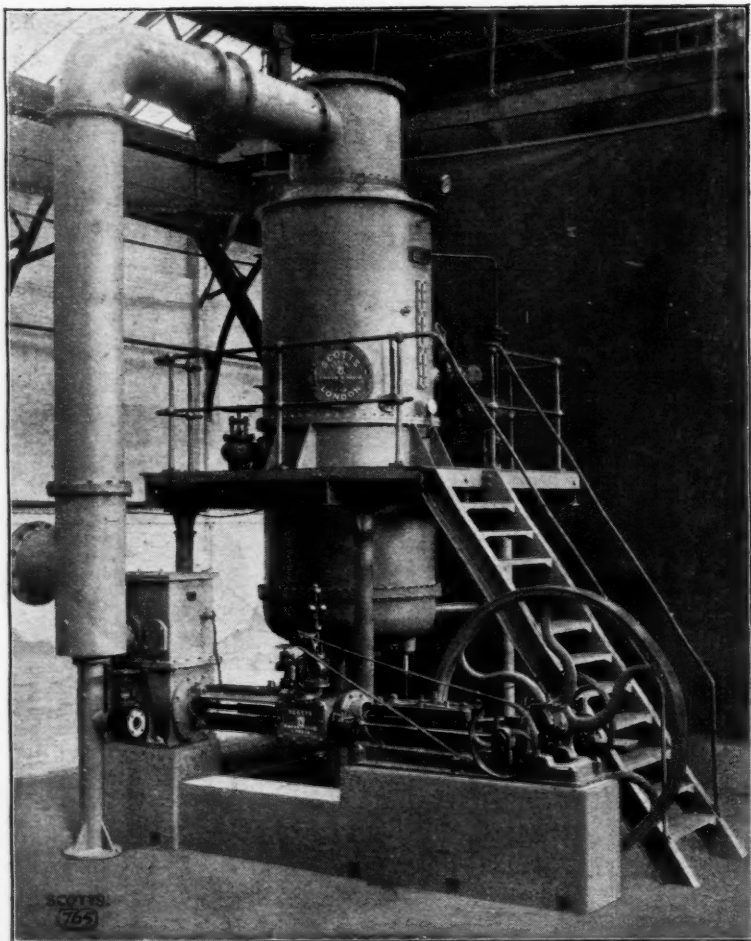


THE VALOR COMPANY, LTD.,

Aston Cross, BIRMINGHAM.

London Office: 120 VICTORIA STREET, S.W.1





COMPLETE

or **PART**

PLANT

For the manufacture
or recovery of

**CAUSTIC
SODA**

Liquor or Solid.

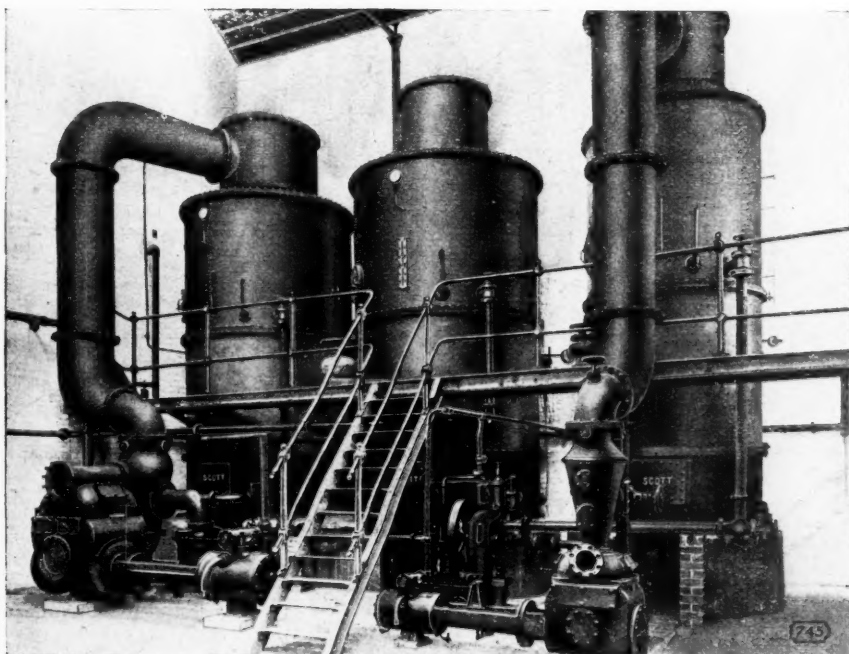
WE have specialised for many years in this manufacture, having installed many hundreds of plants throughout the world.

In an even greater number of cases we have supplied the **Scott Evaporator** for the same work. Two examples are illustrated: the one a Single Effect with automatic feeding device, and the other a Double Effect with a finisher.

George Scott & Son (London), Ltd
CHEMICAL ENGINEERS SINCE 1834.



**By Electrolytic
(Wheeler's Patent)
Process, or by
causticising soda
ash with lime.**



These Evaporators are supplied with our well-established salt extracting and drying chambers for Electrolytic liquors, and can be supplied in any numbers of multiples from single to sextuple, with pre and interheaters, jet, surface, evaporative or barometric condenser.

Recovery of Trade Waste Liquor is an equally important branch of the Scott programme.

All problems fully investigated by a long experienced staff of Chemical Engineers.

The **Scott Evaporator** is a submerged tube type with an intensive circulation which gives a clean separation of the vapour without priming, maintains clean surface, and an exceptional evaporative surface factor.

Note the accessibility and ease of installation.

Kingsway House, London, W.C.2

GEORGE SCOTT & SON (LONDON), LTD.

SATURATORS and all LEADWORK for SULPHATE OF AMMONIA PLANTS



672

Saturators Supplied

JOSEPH TAYLOR

(SATURATORS) LTD.,

*Chemical Plant Engineers,***BLACKHORSE STREET MILLS, BOLTON**

Telegrams: "SATURATORS, BOLTON."

Telephone: 848

ELECTROLYTIC HYDROGEN

Better than Hydrogen produced by any other method for Oil-Hardening and Synthetic Ammonia, being more pure.

Cheaper when produced near an Industrial Centre as there is an almost unlimited demand for the Oxygen By-Product which, being purer and more efficient, realises higher prices than Oxygen made by any other method.

Full particulars of British-made plants from—

A. EDGAR KNOWLES*City Electricity Works***New Crane Street, CHESTER**

Representing:

THE INTEGRAL OXYGEN CO., LTD.

Manufacturers of "Bi-Polar" Cells for 500 to 1,000 amperes (I.O.C. Patents).

The International Electrolytic Plant Co., Ltd.

Manufacturers of "Multi-Polar" Cells for 1,000 amperes upwards (Knowles Patents).

HYDROGEN PLANTS

(MAXTED PROCESS)

PURITY 99.9% AND OVER

*Directly and Without Purification,
Low Cost of Production, Complete
Absence of Catalyst Poisons*

Complete Installations for Catalytic
Hydrogenation of Oils, for Edible
Purposes and Soap Making.

**OXYGEN AND HYDROGEN PLANTS
ELECTROLYTIC PROCESS**

BLUE WATER GAS PLANTS

WE also specialise in the conversion of existing
Plants of the Intermittent Type where bad
results have hitherto been obtained owing to im-
purities in the Hydrogen produced.

**JOHN THOMPSON
(Gas Developments) LTD.**

ETTINGSHALL, WOLVERHAMPTON, ENG.

THE WIDNES FOUNDRY

CO., LTD

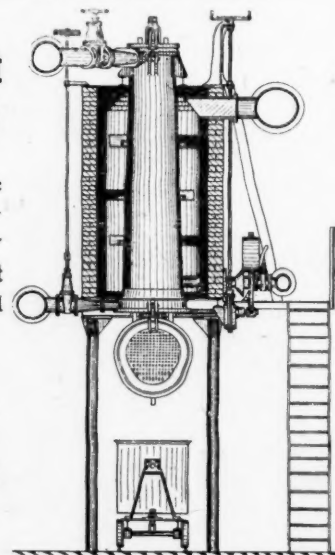
*Engineers and Ironfounders***WIDNES, ENGLAND**

*Telegraphic Address: Foundry, WIDNES, Westcliffe, London
London Office: 19, Idlesleigh House, Westminster, S.W.1
Telephone: WIDNES 225. London: Victoria 4340.*

Chemical Plant Manufacturers

Specialists in the
design and con-
struction of com-
plete Equipment
for the Chemical
and Allied
Industries.

**CASTINGS UP TO
30 TONS. STEEL
WORK FOR
ROOFS, GIRDERS,
AND BUILDINGS.**



Self discharging retort, gas fired.

GEE CENTRIFUGAL SEPARATORS.

Specially suitable for
Filtration of Liquors
at High Temperatures.

GEE CENTRIFUGAL SEPARATORS.

ASAWCO-WEAVE FILTER CLOTH.

The only perfect Acid-
and Heat - Resisting
Filter Cloth.

ASAWCO-WEAVE FILTER CLOTH.

Full particulars on application to

CENTRIFUGAL SEPARATORS, LTD.
8, IDDESLEIGH HOUSE, CAXTON STREET, LONDON, S.W.1.

SOLE AGENTS for GREAT BRITAIN and IRELAND for ASAWCO FILTER CLOTH.

"POWMINCO"
(Trade Mark)

ASBESTOS FILTER FIBRE FOR GOOCH FILTERS

An American speciality made in the U.S.

Why waste valuable time and material in preparing your own filter fibre when you can buy "POWMINCO" special Gooch filter fibre, prepared from the proper asbestos, according to the prescription of Dr. Gooch, chemically pure, and freed from all short and useless fibre, cheaper than you can buy the raw asbestos.

PRICE

In 1 lb. Carton - 21/6

Less than 1 lb. per oz. 1/8

TERMS

Post free. Cash with order.

OUR UNQUALIFIED GUARANTEE
Cash returned immediately if goods
are not satisfactory.

As the smallest credit transaction involves invoice, statement, receipt, several book-keeping entries and postage stamps, it is less expensive for both parties to send cash with order—hence we ask that this be done when practicable.

IN 1921 ABOUT 9,000 LB. OF "POWMINCO" FILTER FIBRES WERE SOLD TO GOVERNMENT INSTITUTIONS, UNIVERSITIES, MANUFACTURERS AND CHEMISTS IN THE U.S. IN THE FEW WEEKS IT HAS BEEN ON SALE IN GT. BRITAIN WE HAVE SOLD IT TO (AND IN SEVERAL CASES RECEIVED REPEAT ORDERS):

H.M. Admiralty Cordite Factory
Artillery College
Bolton Corporat on
British Dyestuffs Corporation
South Metropolitan Gas Co.
Reading Gas Co.

The National Physical Labora-
tory
Leeds University
Glasgow University
Birmingham University
Armstrong College

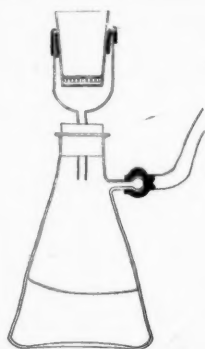
The Lister Institute
A number of Analytical
Chemists
Erith Oil Works
Burroughs Wellcome Co.
B. Winstone & Sons
International Paint Corporation

Shanks & Co.
Continuous Reactions Co.
Holbrook Ltd.
J. H. S. Pattinson
Johnson Bros.
F. Claudet
A. H. Knight

Dealers — HARRINGTON & SONS; HOPKIN and WILLIAMS

Ask your dealer first—then write to

NEWITT & SON, 121 St. Stephen's House, Westminster, S.W.1 (SOLE IMPORTERS)



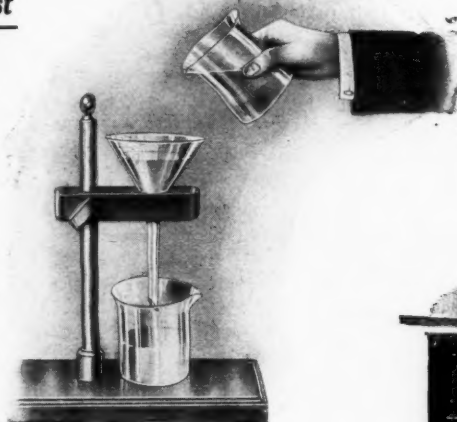
Other and more expensive
prepared asbestos filter fibres
for emulsions, extracts,
essences, wine blending, etc.,
and special filtrations. Write
for List.

Thickening Ahead of Filtration to Increase Filter Efficiency

Make this Simple Test

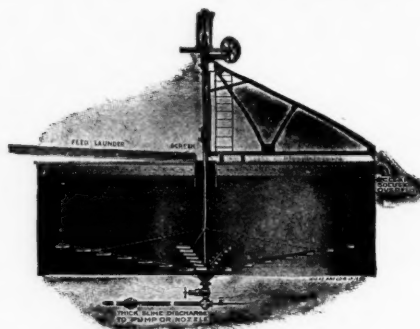
Take a beaker full of the feed to your filter and allow it to stand quietly for an hour. If a quantity of clear solution can be decanted

**WRITE US
ABOUT IT**



WHY OVERLOAD YOUR FILTER WITH SOLUTION THAT CAN BE SETTLED OUT?

DORR THICKENERS installed before Filters will give a thick uniform feed continuously. This enables the filter to form uniform cakes free from segregations



THE DORR COMPANY

ENGINEERS

NEW YORK
101 Park Avenue

LONDON
16 South Street E.C.2

DENVER
1009 17th Street

Fredk. Maynard & Son LIMITED

Wholesale and Export Manufacturers of
Surgical, Medical and Chemical Glass

56 & 56a, Holly St., Dalston, London, E.8

Plain and Stoppered
Glass Bottles of
Every Description,
Graduated Glass
Measures, Chloro-
form Bottles, Acid
Bottles, Spirit Lamps,
Glass Tubes and
Syringes, "Chemical
Bottle Stoppers"

Please mention this Journal when applying for quotations, &c.

OXYGEN for the cutting and welding of metals

If you are not yet making use of Oxygen for Cutting, and the Oxy-Acetylene Welding Process, or wish to hear of the latest improvements in both, write to the BRITISH OXYGEN COMPANY.

THE BRITISH OXYGEN COMPANY, the Founders of the Oxygen Industry, have highly equipped and up-to-date factories in all the important British Industrial Centres, capable of producing over

2,000,000 Cubic Ft. of OXYGEN DAILY.

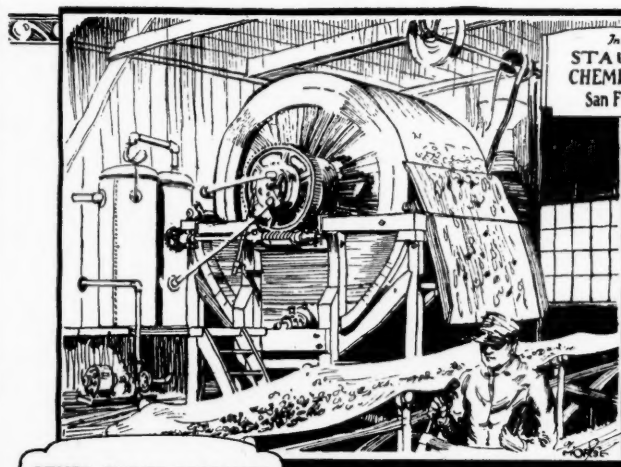
The Company are the foremost manufacturers in Great Britain of Oxygen Metal Cutting Apparatus, Oxy-Acetylene, Oxy-Hydrogen & Oxy-Coal Gas Welding Blowpipes, High Pressure Gas Regulators, etc.

For Catalogue and full particulars apply to any of the Company's Works.



ANGEL ROAD, UPPER EDMONTON, N.18
NORTH WEMBLEY, MIDDLESEX
TUNNEL AVENUE, EAST GREENWICH
SHIELDS RD., WALKER GATE, NEWCASTLE
LOWER WALSALL ST., WOLVERHAMPTON
LODGE ROAD, HUCKLEY, BIRMINGHAM
KNOWSLEY ROAD, BOOTLE
SAVILLE GREEN, LEEDS
TERRY ROAD, COVENTRY
GREAT MARLBOROUGH ST., MANCHESTER
ROSEHILL, POLMADIE, GLASGOW
EAST MOORS, CARDIFF
SAVILLE STREET, SHEFFIELD
BROMBOROUGH PORT, near BIRKENHEAD

THE BRITISH OXYGEN CO. LTD.
BRANCHES IN ALL THE PRINCIPAL INDUSTRIAL CENTRES



In the
STAUFFER
CHEMICAL CO.
San Francisco

The OLIVER Continuous Filter filters ALL DAY- EVERY DAY

OTHER OLIVER PRODUCTS

Oliver Vacuum Pumps.
Oliver Air Compressors.
Oliver Centrifugal Pumps.
Oliver Worm Gear
Speed Reducers.
Olivite Acid-Proof
Centrifugal Pumps.

IN the San Francisco plant of the Stauffer Chemical Co. the acid-proof Oliver Filter illustrated above has operated nine months without change of filter cloth and is still filtering efficiently.

An exclusive Oliver feature—wire windings, which protect the surface of the filtering medium from all contact with the scraper—make this possible.

Oliver Filters and equipment are standard in 84 processes. Sustained effectiveness and economy of operation are recognised Oliver characteristics.

Write to us about your filtration problems and let our experts demonstrate to you how the Oliver Filter will solve them. Our catalogue and complete information on request.

The

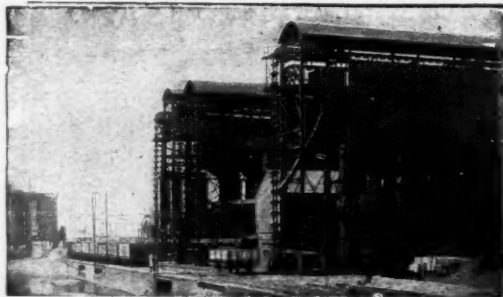
Oliver Continuous Filter Co.

San Francisco
501, Market St.

New York
Aeolian Bldg.

London, W.C.
11, Southampton Row.

CONVEYORS IN GAS WORKS



View of Babcock & Wilcox Gravity Bucket Conveyors.
Capacity 40 tons per hour. Installed at a Midland Gas Power Station

All kinds of
CONVEYOR PLANT
for handling Coal, Coke, etc.

BABCOCK & WILCOX, Ltd.
Patent Water-Tube Steam Boilers

Head Office—
ORIEL HOUSE, FARRINGDON ST., LONDON E.C.
Principal Works—RENFREW, SCOTLAND

STOKES' Automatic Water Still

Size 0 as Illustration
Will Distil Half a Gallon per Hour



NEEDS NO ATTENTION
ECONOMICAL and
EFFICIENT
EASILY FIXED
ONLY REQUIRES GAS
and
WATER CONNECTIONS

LARGER STILLS FOR GAS AND STEAM:—

| Size | Heat | Gals. per hr. | Weight | Height |
|------|-------|---------------|---------|-------------|
| 000 | Gas | 2½ | 110 lb. | 48 in. |
| 000 | Steam | 2½ | 110 lb. | 48 in. |
| 1 | Steam | 5½ | 275 lb. | 3 ft. 6 in. |
| 2 | Steam | 10 | 325 lb. | 4 ft. 6 in. |
| 3 | Steam | 25 | 750 lb. | 7 ft. |

Sole Agents:

THOMPSON & CAPPER, LTD.
MANESTY BUILDINGS, College Lane, LIVERPOOL

Telephone: Royal 2060. Telegrams "Sanitas, Liverpool." Established 1843

REPLACES Ammonia Oxidation POTTING

FOR HSO_2O_4 PLANTS

**SAVES NITRE
POTS
AND
MAINTENANCE
OF
FLUES, OVENS, ETC.**

W.C. HOLMES & CO. LD.
HUDDERSFIELD

COMPAGNIE COMMERCIALE DU NORD (GREAT BRITAIN), LTD.

CHEMICALS, DRUGS, COLOURS, OILS, METALLIC OXIDES.

Chemicals for all Trades: Textiles, Tanning, Paper, Dyeing, etc.
Zinc Dust. Anhydrous SO_2 . Basic Slag. Barium Chloride. Calcium Chloride. Formaldehyde.
Sulphate of Alumina. Casein. Acetate of Soda.

STOCKHOLM TAR. CARBON TETRACHLORIDE. SUPERPHOSPHATES. ZINC CHLORIDE. HYPO.

54, GRACECHURCH STREET, LONDON, E.C. 3.
Telephone Nos.: Ave 6649 & 7281
Telegrams: "ACOMCINORD BILGATE"

ROSE, DOWNS & THOMPSON, Ltd.

OLD FOUNDRY, HULL

28, VICTORIA STREET, S.W.1

Estd. 1777

29, CANTON RD., SHANGHAI

CHEMICAL SOLVENT OIL EXTRACTION PLANT

The plant with the largest experience behind it, and acknowledged to be the best.

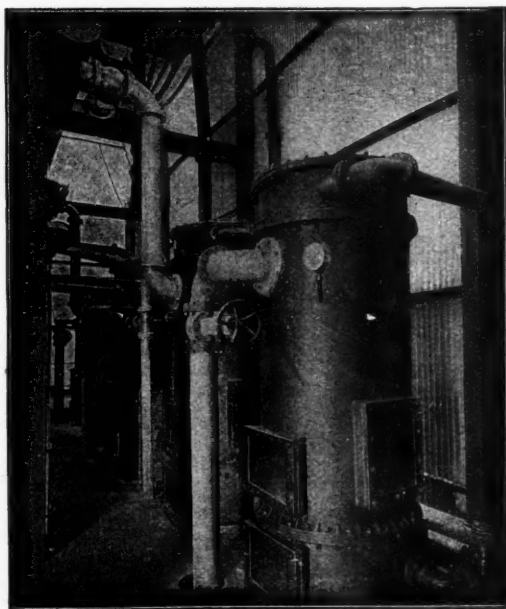
Arranged for either light or heavy solvents on the most economical lines.

SINGLE UNIT and BATTERY PLANTS for liquid solvents and vapours of all kinds.

PLANT to treat WASTE PRODUCTS of every description.

Also

NEUTRALISERS, BLEACHERS
AND DEODORISERS



View in Chemical Extraction Plant

AIR & GAS COMPRESSORS

for all purposes and pressures up to 450 atmospheres. Standard types of from one to six stages

The illustration shows a four stage compressor and steam engine for use in the production of Synthetic Ammonia

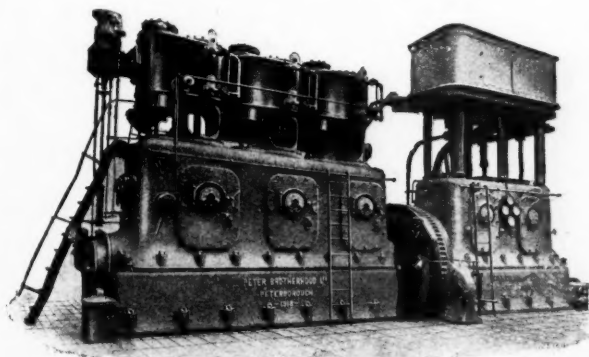
Capacity. 1,000 cub. ft. $N + H_3$
per minute

Pressure. 200 atmospheres

B.H.P. 500

R.P.M. 225

Write for Catalogue to



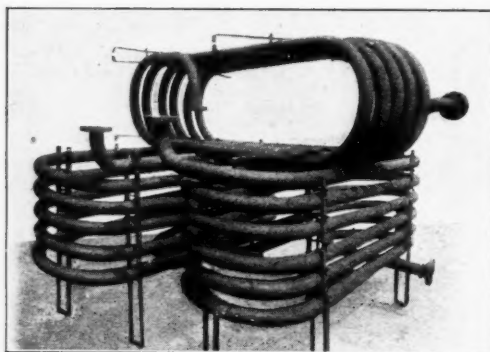
PETER BROTHERHOOD LTD

Head Office & Works

PETERBOROUGH · ENGLAND

BRANCHES: LONDON MANCHESTER NEWCASTLE ON TYNE
BIRMINGHAM AND GLASGOW





COILS

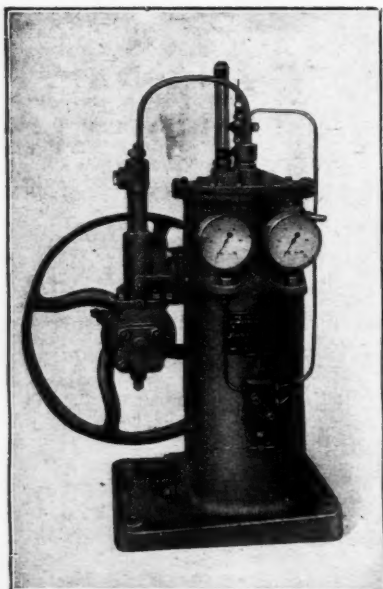
WE MANUFACTURE COILS
FOR EVERY CHEMICAL PLANT
REQUIREMENT.

PIPE LINES

WELDED STEEL TEES, BENDS,
SPECIAL HEADERS,
ETC.

THE
MILLWALL
ENGINEERING CO. LTD.
21, PANTON ST.,
LONDON, S.W. 1.
TELEPHONE: GERRARD 1327-8
TELEGRAMS-CABLES: "IRONWARE, PICCY, LONDON."

CONDENSERS



SAVE SURFACE BY REFRIGERATING YOUR COILS

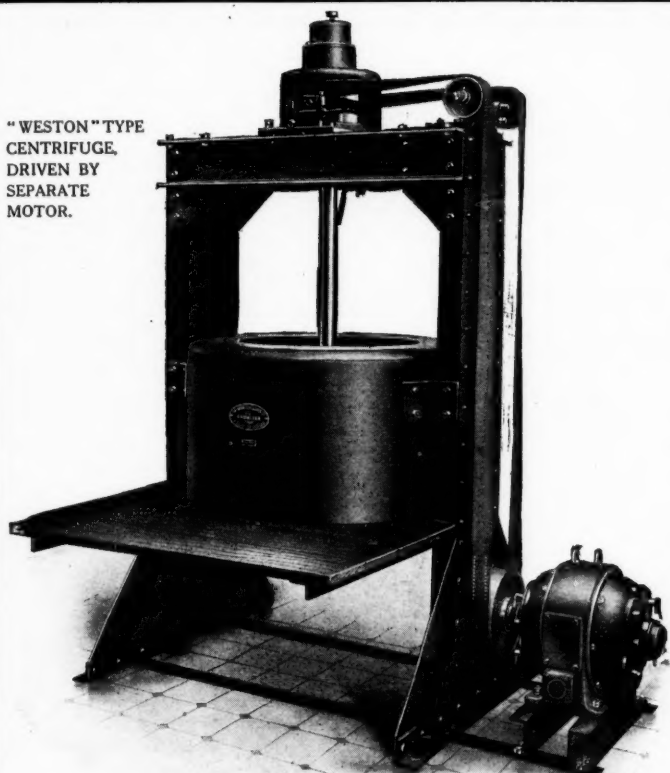
Our machines require no skilled attention—
anyone can run them. Turn the switch, and
the machine does the rest.

SEND US YOUR PROBLEMS
Coils of copper, iron, or steel for any pressures.

John Kirkaldy
LIMITED ESTD 1809

101 Leadenhall St., London, E.C. 3

"WESTON" TYPE
CENTRIFUGE,
DRIVEN BY
SEPARATE
MOTOR.



NEW DESIGNS
OF GREAT EFFICIENCY

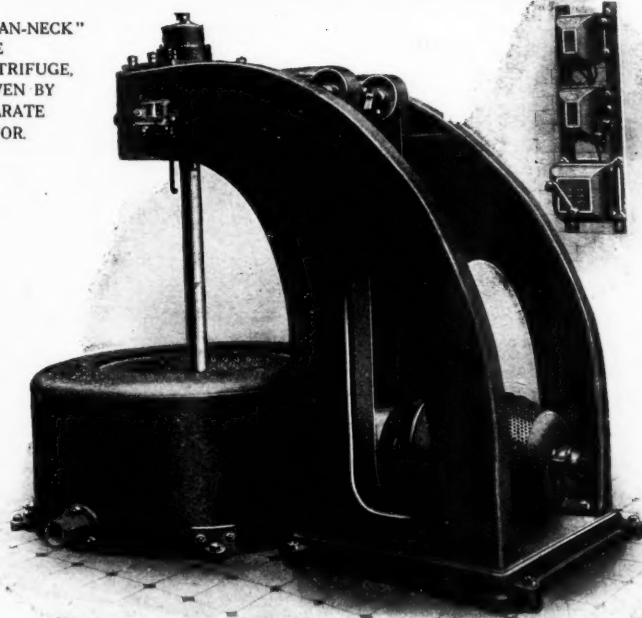
STEAM, BELT or ELECTRICALLY-DRIVEN
CENTRIFUGES

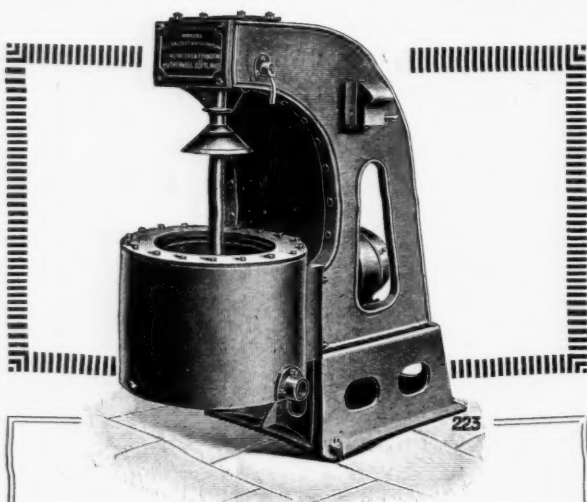
FOR EVERY CLASS of CENTRIFUGAL SEPARATION or FILTRATION

WRITE FOR
CATALOGUES & PRICES

THOMAS BROADBENT & SONS LTD.
CENTRAL IRONWORKS,
HUDDERSFIELD.

"SWAN-NECK"
TYPE
CENTRIFUGE,
DRIVEN BY
SEPARATE
MOTOR.





Centrifugal Dryers

If you have a drying problem submit it to us.

We may be able to help you!

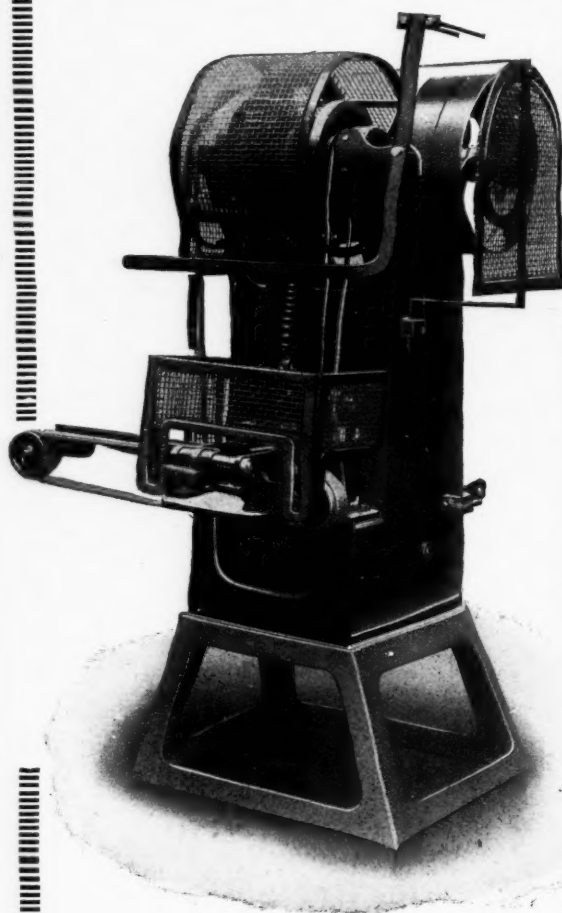
We have hundreds of Centrifugals at work in most of the large Chemical Plants, Gas Works, Steel Works, etc. in the Kingdom, handling all classes of products from the finest to the largest crystals.

Our machines are specially designed for dealing with Sulphate of Ammonia and other by-products.

Catalogue on Request

**Pott, Cassels
& Williamson
MOTHERWELL
SCOTLAND**

Soap Stamping



50 to 60 tablets stamped per minute

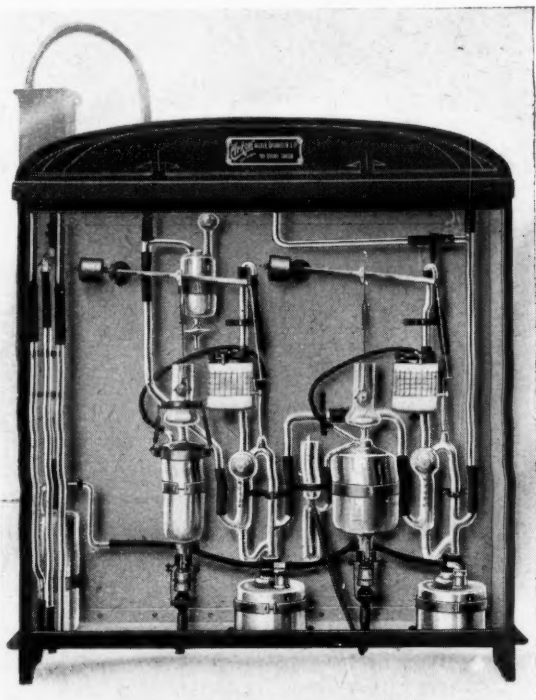
THESE MACHINES CAN BE worked in conjunction with our Patent Soap Wrapping Machines & can be adapted to special requirements.

INSTALLED IN MANY LEADING SOAP FACTORIES

FORGROVE MACHINERY CO., LTD.

DEWSBURY RD., LEEDS.

Manufacturers of Tablet and Pill Counting and Filling Machines, also Machines for Medicated Tablet Wrapping and Assembling, Carton Wrapping and Labelling, Compressed Powder Block Wrapping, and for Wrapping Chocolate Tablets of all descriptions.



"Arkon" Combined CO_2 and O Recorder

CO_2 — O Cl — SO_2
Recorders
 also

CO_2 & O Combined Recorders and CO_2 Multiple Recorders

"ARKON" Recorders for these gases have been for many years standard practice abroad.

They are used to control chemical processes at every point. They have gained the highest reputation for simplicity and reliability. Their analysis records are accepted everywhere as an infallible test of output.

"Arkon" Recorders work only by direct absorption of gases. In workmanship and design as well as for usefulness and reliability these instruments have earned a high reputation among managers of chemical works and others in charge of chemical processes.

"Arkon"

The "Arkon" Range of Gas Analysis Recorders includes:—

Single CO_2 Recorders in Glass.

Single CO_2 Recorders in Metal.

Multiple CO_2 Recorders and

Combined CO_2 & O Recorders.

Also single Oxygen Recorders, Sulphur Dioxide

Recorders and Chlorine Recorders.

A selection of chart ranges is possible with most instruments.

Send for Descriptive Pamphlets to—

Walker, Crossweller & Co.,

"Dane's Inn House," 265 Strand, London

SIMON'S PATENT DRYING MACHINES

AUTOMATIC and CONTINUOUS.
 REQUIRE Very LITTLE SPACE.
 DEMONSTRATIONS ON YOUR
 OWN MATERIAL can be given.

RICHARD SIMON & SONS
 LIMITED

Phoenix Works,
 NOTTINGHAM

Specialists in Drying Plants for
 over 30 years.

OIL ON OFFER

The Caltex Oil Company, having acquired European marketing rights for the products of a large American and Mexican producing and refining company, are prepared to quote for:

FUEL OIL

S.G. .960, Flash over 150°F .

CRUDE OILS S.G. .927/39

CRUDE PETROL Approx S.G. .748/50

REFINED PETROL.. Approx S.G. .760

Very favourable terms for large contracts. Delivery at any European, Mexican or U.S. Port. Enquiries to

CALTEX OIL CO.

50 Pall Mall, London, S.W.1

(Please mention "Chemical Age")

IMPORTANT CHEMICAL BOOKS

Please send for Detailed Prospectuses and Complete Descriptive Catalogue.

Just Published.

MODERN GASWORKS PRACTICE

By ALWYNE MEADE, Engineer at the Wapping Works of the Commercial Gas Company, etc.

SECOND EDITION. Re-written and greatly enlarged. Crown 4to, 876 pp., with 500 illustrations and index of 2,000 references. 55/- net. The second edition of this standard work will, it is hoped, prove invaluable to chemists engaged at gasworks. All the original chapters have been expanded, and the three new ones deal with "The Measurement of High Temperatures in Gasworks," "Naphthalene in Coal Gas," and "The Complete Gasification of Coal." The last-named chapter gives the only existing collated information as to total carbonization, and will, no doubt, lead to a good deal of discussion.

Just Published.

THE PRACTICAL CHEMISTRY OF COAL AND ITS PRODUCTS

By A. E. FINDLEY, B.Sc., A.I.C., and R. WIGGINTON, B.Sc., A.R.C.S.

Demy 8vo.

With numerous illustrations, diagrams and tables.

12/6 net.

This work embodies, with additions, the laboratory course in fuel technology at Sheffield University. Among the subjects treated are: Purifying Materials—Ammonia and its Allies—Benzol—Coal Tar and its Distillates—Coal Ash—Gas Analysis—Calorimetry and Pyrometry—Fuel Oils.

BENZOL: Its Recovery, Rectification, and Uses

By S. E. WHITEHEAD, B.Sc., F.C.S. With an Introduction by LORD MOULTON.

Demy 8vo.

With 67 illustrations.

12/6 net.

Contents.—Recovery of Benzol from Gas: Introductory—Theoretical Principles—The Extraction of Benzol from Gas—The Debenzoling Plant—Accessory Plant—Operation and Control of the Apparatus—Dephlegmation and the Naphthalene Question—Precautions and Difficulties in Working—Cost of Crude Benzol Recovery. The Rectification of Benzol: Crude Benzol and its Usual Products—The Rectification Process—The Rectification Plant—Operation and Control of the Rectification Plant—Precautions and Difficulties in Rectifying—The Cost of Benzol Rectification. The Uses of Benzol and its Products: Artificial Dyestuffs, Drugs, etc.—Explosives—Benzol as a Motor Fuel—Subsidiary Uses for Benzol Products—Analysis of Crude Benzol by Dr. Colman's Method—Data and Tables.

"Timely, valuable, very complete."—TIMES.

THE CARBONISATION OF COAL

A Scientific Review of the Formation, Composition and Destructive Distillation of Coal for Gas, Coke and By-Products.

By Prof. VIVIAN BYAM LEWES, F.I.C., F.C.S. With a Section on recent developments by ALFRED BROADHEAD SEARLE.

SECOND EDITION.

Demy 8vo, with 30 illustrations.

12/6 net.

Contents.—The Formation and Composition of Coal—The Classification and Distribution of Coal—The Form of Retorts Used in Gas Manufacture—Coke Ovens and their Development—The Conditions Existing in the Destructive Distillation of Coal—The Primary Gaseous Products of the Destructive Distillation of Coal, and the Bodies from which it has been Formed—Tar: Its Formation, Use and Decomposition—Coke—The Nitrogen and Sulphur of Coal and their Recovery—Modern Coal Gas—Appendix.

"Will be hailed with satisfaction by all those who are interested in carbonising work and who desire to possess the most recent information on this important subject."—TIMES.

COAL TAR DISTILLATION And Working-up of Tar Products

A text-book for the Managers of Tar Works, Coke Oven Works, Gas Works, and Students of Technical Chemistry.

By ARTHUR R. WARNES, Chemical Engineer and Technical Chemist; Mem. Soc. Chem. Industry, Mem. Faraday Soc., etc.

SECOND EDITION.

Demy 8vo, with illustrations.

12/6 net.

Contents.—Coal Tar—Its Composition—Effect of Nature of Raw Material and Heat of Carbonisation on Physical Properties and Chemical Composition of Tar—Results of Practical Distillations—Coalite Tar—Vertical Retort Tar—Increasing Toluene in Tar—"Free Carbon" of Tar—How Tar is Received from Gasworks—Tar Tips—Storage of Tar—Construction of Storage Tanks—Pumps—Tar Mains—Plant Used in the Distillation of Tar—Distillation of Coal Tar—Plant for Recovering Cresylic and Carbollic Acids from Oils—The Recovery of Carbollic and Cresylic Acids—Plant for the Recovery of Benzols, Naphthas, etc.—The Recovery of Benzols and Naphthas—First Distillation and Washing—The Rectification of Benzols and Naphthas—Plant for the Working-up of Pyridine from Pyridine Acid—The Recovery and Rectification of Pyridine Bases—Plant for the Manufacture of Crude Naphthalene and Anthracene—The Manufacture of Crude Naphthalene and Anthracene—Pitch and Pitch "Getting"—Creosote—Gas Stripping—Tarworks Tests.

"The volume will be found almost indispensable to those engaged in working-up the chief products obtained by the distillation of coal tar . . . a vast amount of information."—COAL AND IRON TRADES REVIEW.

THE MANUFACTURE OF SULPHATE OF AMMONIA AND CRUDE AMMONIA

By GASCOIGNE T. CALVERT, late Works Manager of the Nechells Chemical Works, Birmingham.

SECOND EDITION.

Demy 8vo, with about 100 illustrations.

9/- net.

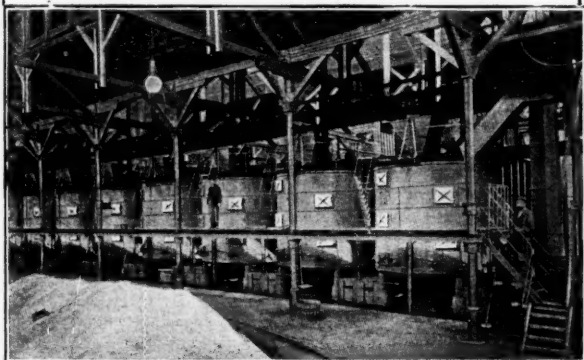
Contents.—Sulphate of Ammonia: Its Composition and Analysis—The Raw Materials: Ammoniacal Liquor, Sulphuric Acid and Lime—Plant Required for the Manufacture of Sulphate of Ammonia: General Description—Supply of Ammoniacal Liquor—Tachometer—Superheaters—Plant Required for the Manufacture of Sulphate of Ammonia—Starting, Working and Stopping the Plant—Difficulties in Working and their Remedies—Cost of Manufacture of Sulphate of Ammonia—Manufacture of Crude Ammonia or Concentrated Ammoniacal Liquor—Manufacture of Sulphate of Ammonia in Small Works—Miscellaneous: Alkali, etc., Works Regulation Act, 1906—Factory Acts (Special Regulations)—Respirators—Sulphuric Acid—Quantity of Ammoniacal Liquor Required to Make a Ton of Sulphate—Analysis of Waste Liquor, etc.—Appendix.

"Much in advance of the ordinary text-book or treatise on technical chemistry. . . . The book deals concisely but adequately with the composition and analysis of sulphate, raw materials, the plant and the control and working of a still."—CHEMICAL TRADE JOURNAL.

LONDON: BENN BROTHERS, Ltd., 8 Bouverie Street, E.C.4

Huntington, Heberlein & Co. Ltd.

Metallurgical, Chemical and Mechanical Engineers.
18, Idlesleigh House, Caxton Street, London, S.W.1

**MECHANICAL ROASTING FURNACES**

HERRESHOFF and "H.H." TYPES for Roasting Pyrites
Spent Oxide, Blende, Tin or Lead Ores.

Capacity from 3 to 20 tons or more in 24 hours.

SULPHURIC ACID PLANTS

Constructional Steelwork
Elevating, Conveying and
Crushing Plants

Accessories of all kinds
Galliard, Kessler or Gilchrist Concentrators

Leadless Towers

Acid Proof Masonry and
Cement

Excavator for Superphosphate Dens

Installations Designed
Erected and Started

Old Plants Reconstructed

SULPHATE OF COPPER

"MAPLE" Brand (Powder or Crystals), Guaranteed 98/99%

NICKEL SALTS

(Powder and Crystals)

AND

NICKEL ANODES

(Rolled and Cast), 99/100%

For ELECTRO-PLATING, Etc.

NICKEL
MOND

Analysis - - - 99.8% Ni.

The MOND NICKEL Co., Ltd.

39, Victoria Street, London, S.W.1

**SOME OF OUR MOST USUAL COMPONENT MATERIALS**

ALLOYED GOLD
FINE GOLD
FINE SILVER
IRIDIO-PLATINUM
OSMIUM
PALLADIUM
PLATINUM
RHODIO-PLATINUM
RUTHENIUM
SILVER
STANDARD SILVER
WHITE GOLD
WHITE PLATINUM

GOLD, SILVER, AND THE PLATINUM, METALS.

We buy these metals in all forms of scrap and residue.

We refine & manufacture them in every known commercial form.

We are the leading Assayers & Analysts in the Precious Metal Industry.

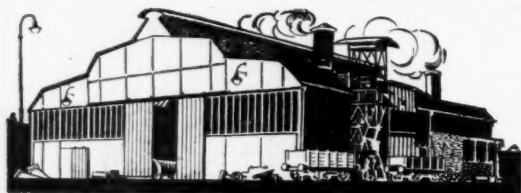
ON EVERY SUBJECT RELATIVE TO THE PRECIOUS METALS YOU WILL SAVE TIME & MONEY BY WRITING TO

Johnson Matthey & Co Ltd

THE WORLD'S CLEARING HOUSE FOR THE PRECIOUS & RARE METALS.
HEAD OFFICE: HATTON GARDEN, LONDON, E.C.1
WORKS: LONDON, MANCHESTER, BIRMINGHAM, BURSLEM.

**SOME OF THE TRADES WHOSE REQUIREMENTS WE COVER**

CERAMIC MANFRS
CHEMICAL LABORATORIES
ELECTRICAL APPARATUS MANFRS
ELECTRO PLATERS
GLASS MANUFACTURERS
GLASS SILVERERS
GOLD BEATERS
MANUFACTURING JEWELLERS
MARKING INK MANFRS
PHOTOGRAPHIC DEALERS
PHOTOGRAPHIC MANFRS
X-RAY SCREEN MANFRS
X-RAY TUBE MANFRS



CHEMICAL APPARATUS

CORROSION

must be avoided in most chemical manufactures. Submit your corrosion problems to us and we can offer you plant lined with copper, tin, nickel or homogeneous lead, or constructed of special alloys to meet the most stringent requirements.

ENSINK
HILVERSUM · HOLLAND

SOLE REPRESENTATIVE
HUGH GRIFFITHS
B.Sc.A.R.C.Sc.
TELEPHONE:
CITY 3302



15 NEW BRIDGE STREET
LONDON E.C.4
TELEGRAMS:
DEHYDRATE,
FLEET, LONDON

GLASS BLOWING SPECIALITY—RESEARCH APPARATUS

Gas Analysis Apparatus of every description.
Dewar Flasks and Cylinders—Silvered and Unsilvered.
Condensers (Glass)—all sizes and kinds.
Separating Funnels, 50 cc. to 5 Litre.
Sextettes—Ordinary Pattern or with all parts Ground.
Gas Holders (Glass)—up to 20 Litre. All parts Ground.
Desiccators—Vacuum or Ordinary Pattern.
Pumps—Mercury Sprengel, Topley, Antropoff and Metal.
Graduated Ware—Burettes, Pipettes, Cylinders, Flasks.
Thermometers—all kinds.
Taps (Glass)—all sizes and kinds. Mercury Seal Taps.
Ground Glass Joints and Flanges.
Conductivity Cells and Apparatus of Soda, or Resistance Glass.
Reagent and Sample Bottles—all sizes.
Apparatus made in Jena Glass, Transparent Quartz, or Vitreosil, to sketch and specification.
All kinds of Apparatus REPAIRED.
Agents for Resistance Glass Beakers, Flasks, Porcelain Basins and Crucibles.

THE SCIENTIFIC GLASS-BLOWING Co.
University Buildings, Bridge St. Oxford Rd., MANCHESTER

FILLING MACHINES

FOR ACIDS AND CHEMICALS

Bottle Washing, Stoppering & Capsuling Apparatus, &c.



FARROW & JACKSON LTD

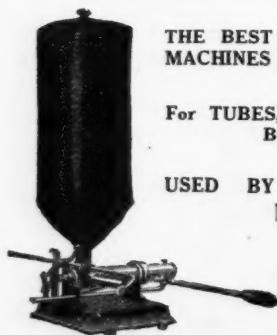
Manufacturers and Engineers

16, GREAT TOWER ST., LONDON, E.C.3

*Increase Your Output
and Save Labour*

BY USING THE

“CENTRAC” FILLING MACHINES



THE BEST AND CHEAPEST
MACHINES ON THE MARKET

For TUBES, POTS, JARS and
BOTTLES

USED BY ALL LEADING
FIRMS

SEND US YOUR
REQUIREMENTS

Tubes, Jars, Pots, Filling Machine.

SOLE MAKERS:

THE BANISTER STREET WORKS,
ENGINEERS, LTD.

45, High Street, HOMERTON, E.9

THE POWELL DUFFRYN STEAM COAL CO., LTD.

Head Office - - - - CARDIFF

ANNUAL OUTPUT - - - - 4,000,000 TONS.
CONTRACTORS TO THE BRITISH ADMIRALTY
COAL, COKE, AND BYE-PRODUCTS.

Bye-Products

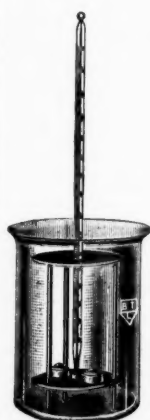
SOLVENT NAPHTHA (Flash point 75° F.)
HEAVY NAPHTHA (Flash Point 100° F.)
PITCH, HEAVY CREOSOTE OIL
STRAINED ANTHRACENE OIL
WHIZZED NAPHTHALENE SALTS

Approximate Melting Points:
“T” Quality 70° to 74° C.
Ordinary „ 55° to 60° C.

SULPHATE OF AMMONIA
SULPHURIC ACID
NATIONAL BENZOLE, TOLUOL



BAIRD & TATLOCK (LONDON) LTD.
SCIENTIFIC INSTRUMENT MANUFACTURERS
— AND —
LABORATORY FURNISHERS



Melting Point
Test.

SPECIAL APPARATUS FOR TESTING BITUMINOUS MATERIALS

14-15 CROSS STREET HATTON GARDEN LONDON E.C.1

Standard
Float Test.



LEEDS & BRADFORD BOILER CO., LTD.
STANNINGLEY

Complete
Tar
Distilling
Plants



Tar
De-
Hydrating
Plants

HIGH-CLASS TAR STILL

Tops and bottoms pressed to shape by Special Hydraulic Machinery; Rivet Holes drilled in position, and all riveting where practicable done by Hydraulic Machinery, which together ensure the highest possible class of Tar Still made.

NEW STILL BOTTOMS

BENZOL STILL, AIR RECEIVERS, CONDENSING TANKS, DISTILLATE TANKS, STORAGE TANKS, PANS, etc. Inquiries solicited for all kinds of Riveted Steel Plate Work, and Hydraulic Press Work.

Estab.^d 1837. Contractors to H.M. Government.

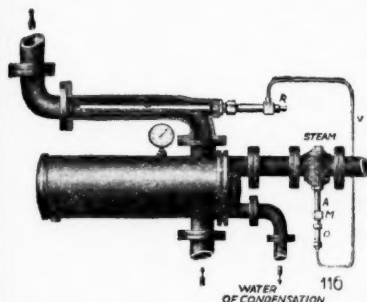
ALEX. ROWAT & CO., Ltd.

Wire Works
60, GALLOWGATE, GLASGOW
Manufacturers of
WOVE WIRE AND WIREWORK
EVERY DESCRIPTION.

Boiler Tube Brushes of superior quality
Prices, &c., on Application.



"SAMSON" AUTOMATIC TEMPERATURE REGULATORS



whether applied to Heating or Cooling Processes can be relied on to keep your temperatures constant within $\pm 1^\circ$. Range of adjustment 100°F . They consume no energy but save fuel. Any temperature up to 600°F . Any size valve up to 8 in. Self-contained, robust and all metal.

OTHER MANUFACTURES

Pressure Reducing Valves. Expansion Steam Traps, for any capacity. Automatic Mixing Valves for Hot and Cold Water or Water and Steam. Electrically operated Valves, etc.

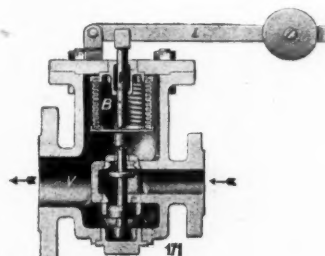
Lists on application.

Sole Makers

The Steam Fittings Co., Ltd., West Drayton, Middlesex

Telegrams: "Cinch, West Drayton."

Telephone: 18 Yiewsley.



MODERN GASWORKS PRACTICE

By ALWYNE MEADE

"A work which no one seriously concerned in the practice of gas manufacture can afford to be without"

Dr. CHARLES CARPENTER, ON THE NEW AND ENLARGED EDITION

876 pp.

55/- (By Post 56/3)

500 Illustrations

BENN BROTHERS, LIMITED, 8 BOUVERIE STREET, E.C.4.

A New Book of Special Interest to the Chemical Industry.

BENZOL

ITS RECOVERY, RECTIFICATION AND USES.

By S. E. WHITEHEAD, B.Sc. Eng. (Lond.), F.C.S.

With an Introductory Note by the late Rt. Hon. Lord Moulton.

"Timely . . . valuable . . . very complete."—Times Engineering Supplement.

"His book is the only one of its kind, and should prove an indispensable vade-mecum."—Chemical Age.

"Mr. Whitehead was in an extremely favourable position for collating information, and has given the industry the fruits of his labour in a : easily readable form."—Colliery Guardian.

204 pages. Size 5½"×8½". Price 13/3 post free.

CONTENTS

Recovery of Benzol from Gas: Introductory—Theoretical Principles—The Extraction of Benzol from Gas—The Debenzolisng Plant—Accessory Plant—Operation and Control of the Apparatus—Dephlegmation and the Naphthalene Question—Precautions and Difficulties in Working—Cost of Crude Benzol Recovery. The Rectification of Benzol: Crude Benzol and Its Usual Products—The Rectification Process

—The Rectification Plant—Operation and Control of the Rectification Plant—Precautions and Difficulties in Rectifying—The Cost of Benzol Rectification. The Use of Benzol and Its Products: Artificial Dye-stuffs, Drugs, etc.—Explosives—Benzol as a Motor Fuel—Subsidiary Uses for Benzol Products—Analysis of Crude Benzol by Dr. Colman's Method—Data and Tables.

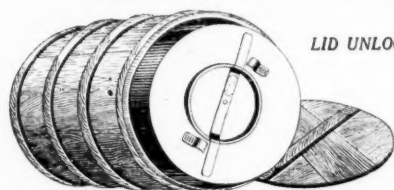
Our Book Department can supply any book on any subject, and places its advice at your disposal.

BENN BROTHERS, LIMITED

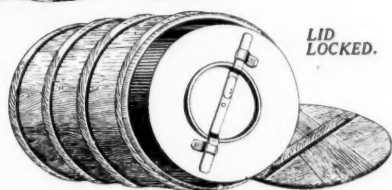
8, BOUVERIE STREET (Book Department), LONDON, E.C.4.

PATENT
AIR-TIGHT PACKAGE
FOR
HIGH-CLASS CHEMICALS
AND OTHER GOODS

THE PACKAGE IS COMPOSED OF SUITABLE
WOODEN OUTER AND IS FITTED WITH
METAL INNER DRUM, PROVIDED WITH
PATENT SELF-LOCKING LEVER LID.



LID UNLOCKED.



LID
LOCKED.

ROUND AND SQUARE
MACHINE - MADE TINS

to contain all classes of fluids

LEVER and SLIP LID TINS

Plain or Printed

MOTOR OIL and GREASE
TINS

KEROSENE TINS

VARNISH CANS

Etc.

E. T. GEE & SONS, LTD.

TELEPHONE :
ROYAL 4304

RELIANCE TIN BOX WORKS

MARK STREET
LIVERPOOL

TELEGRAMS :
"BRITENESS."

SACKS, BAGS

JUTE GOODS

IMPORT EXPORT

All Descriptions of New and Secondhand for
every purpose Stocked Ready for Delivery.

BAGS FOR CHEMICALS A SPECIALITY

ESTABLISHED
1885

TELEPHONE :
CENTRAL
340

ROBT DAVIS & SON LTD
C19 EXCHANGE BUILDINGS
LIVERPOOL

Also at BELFAST and DUBLIN

INCORPORATED
1908

TELEGRAMS :
HESTWILSAC,
LIVERPOOL

CHAS. PAGE & CO. LTD.

MANCHESTER:

422/425 Royal Exchange

Wires: "Paganini, Manchester."

'Phones: Central 1882 (2 lines)

LONDON:

47/51 KING WILLIAM ST., E.C.4

"Paganini, Cannon, London."

Avenue 1729 (3 lines), Minorities 2250 (3 lines)

GLASGOW:

31 St. Vincent Place

"Paganini, Glasgow."

Central 452

*OFFER AT FIRST HAND FOR PROMPT AND REGULAR DELIVERY***FORMIC ACID****HYPOSULPHITE OF SODA****CHLORIDE OF SULPHUR****ACETONE****LEAD ACETATE****BETA NAPHTHOL***FULL LISTS ON APPLICATION*

— ESTABLISHED 1793 —

NEWTON, CHAMBERS & CO. LTD.THORNCLIFFE,NEAR SHEFFIELD.

— FOR —

GAS WORKS,**CHEMICAL WORKS,**

— AND —

BY-PRODUCT PLANTS.

